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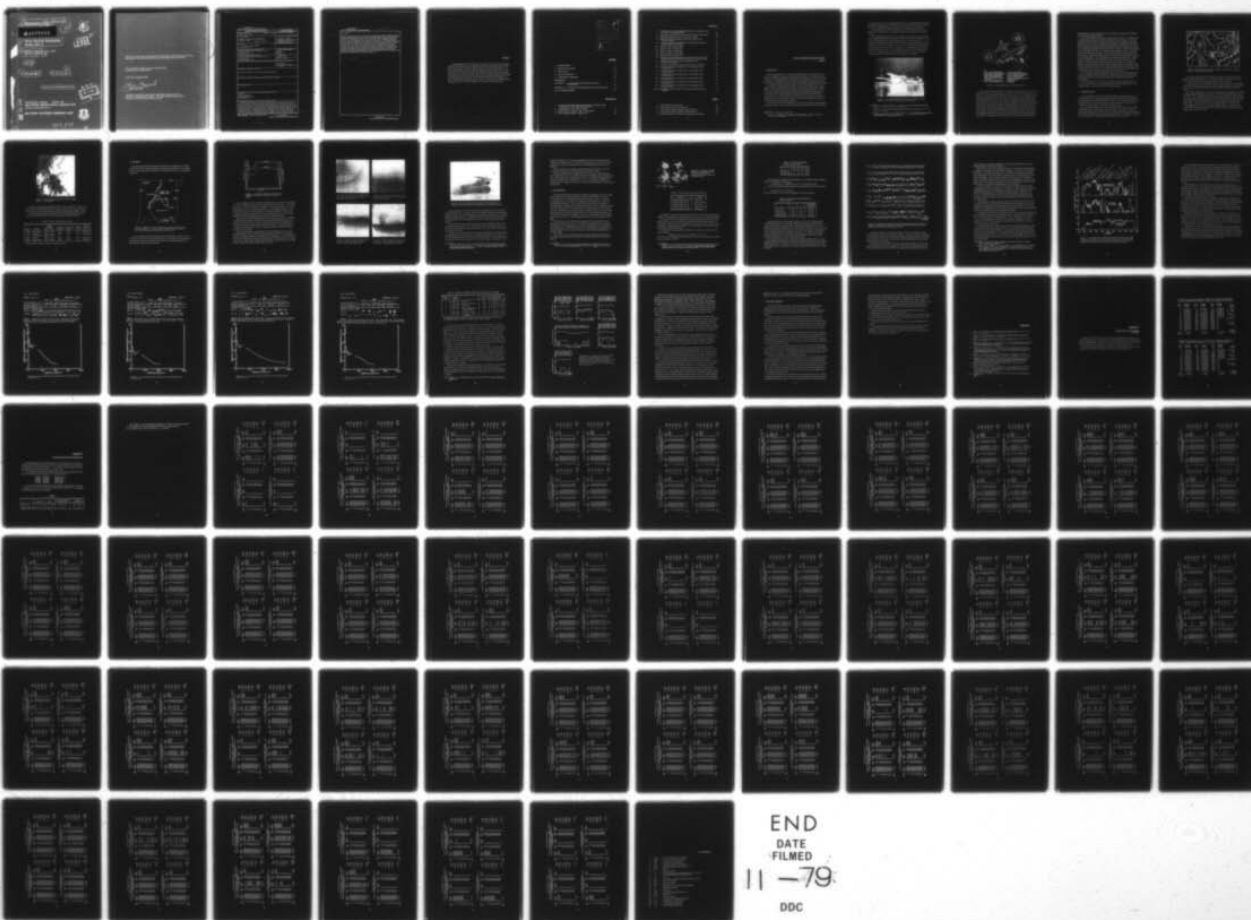
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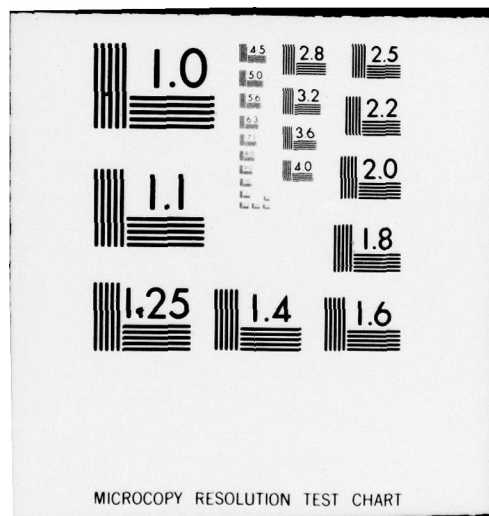
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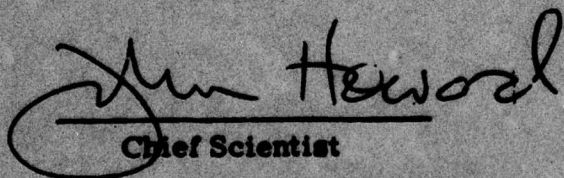
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FOR THE COMMANDER


Chief Scientist

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This is the fourth in a series of reports presenting particle distribution data acquired in cirrus clouds over the western U.S. The data herein were obtained 21 March 1978 by an instrumented MC-130E near Albuquerque, N. M. The area was under the influence of a slight upper level ridge, and the cirrus appeared related to jet stream winds. No significant surface weather was present at the time. Results include the following: (1) The largest particles measured were near $2500 \mu m$, but there were only one or fewer of these per m^3 ; (2) occasional particles as large as $1300 \mu m$ were recorded in what		

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visually was cloud-free air; (3) few of the particles could be recognized in any known classification system but those most frequently recognized were bullet rosettes; (4) the PMS 2-D data revealed particle-type changes occurring in 5 sec or less of flight time; (5) a halo around the sun was periodically seen when mixed-type crystals containing bullet rosettes were recorded; (6) varying numbers of small particles (~ 1 to $28 \mu m$) were recorded almost continually, even in clear air, while the aircraft was between 23,000 ft (7.0 km) and 27,300 ft (8.3 km) MSL; (7) computed ice water content values generally decreased with height and increased with temperature in the cirriform clouds sampled; (8) particle size spectra were seldom exponential for particles smaller than approximately $250 \mu m$; and (9) bimodal peaks were frequent in the population distribution near 100 and $250 \mu m$.

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Preface

In continuing this series of studies of ice particle clouds we extend our appreciation to the pilots and crew of the 4950th Test Wing at Wright-Patterson AFB for their flying of the MC-130E that obtained the data described in this report. The AFGL mission director for the particular flight described in this report was Capt Donald Cameron, and the technicians who monitored and maintained the sampling instruments were MSgt James Bush, TSgt Marshall Wright and SSgt Dennis LaGross. Our thanks also go to Ms Barbara Main for developing ancillary information, to Mrs. Pat Sheehy for typing assistance, and to Mr. James Lally of Digital Programming Services, Inc. for aid in computer processing the cloud particle data.

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Cirrus Particle Distribution Study Part 4

1. INTRODUCTION

This is the fourth part in a series of presentations of cirrus particle data acquired by a 4950th Test Wing MC-130E aircraft (see Figure 1). Some of the instruments that have been installed for cloud physics measurements by AFGL are shown in Figure 2. The flights of this series have been sponsored and funded by the Air Force Weapons Laboratory's (AFWL) Advanced Radiation Technology (ART) program.

The purpose of these flights is twofold. First, the information on the sizes, shapes, and concentrations of ice and snow as observed in cirrus clouds is being used by AFWL as input to theoretical models of laser beam attenuation. Second, a data base of these cloud physics parameters is being collected, principally over New Mexico, for use in the planning and testing of the AFWL Airborne Laser Laboratory (ALL). The MC-130E is scheduled to fly at a later date, in formation with the ALL over New Mexico to measure ice particles during tests of the ALL system and tests of the attenuation models.

Part 1¹ in this series described some of the aircraft sampling instrumentation and its limitations. It also described the format of the data sheets used in that and

(Received for publication 15 June 1979)

1. Varley, D.J. (1978) Cirrus Particle Distribution Study, Part 1, AFGL-TR-78-0192, AD A061485.

the present study. Part 2² presented particle data for a flight through cirrostratus and cirrus near Albuquerque on 26 February 1978, and Part 3³ contained similar data from a sampling mission through very thin cirrus on 18 March 1978.

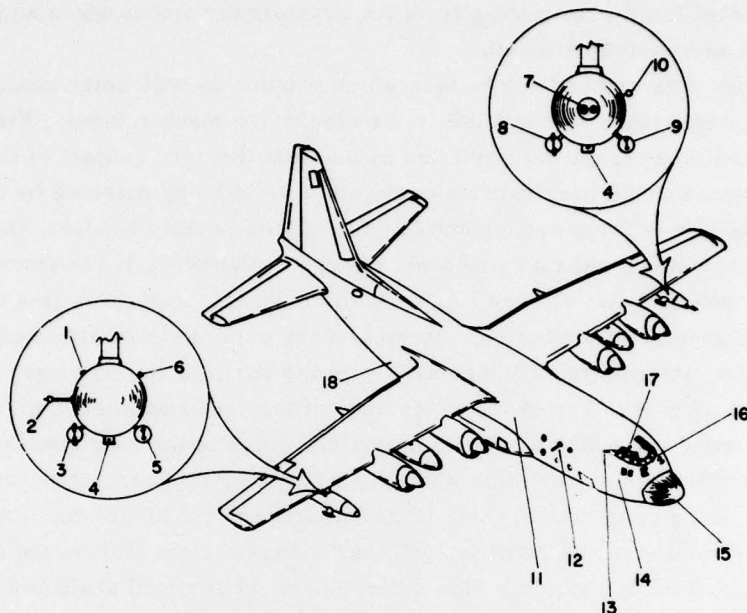
This fourth part describes and presents the data obtained 21 March 1978 in a flight south of Albuquerque, New Mexico through varying densities of cirriform clouds.

The largest particles observed in our studies of cirriform clouds to date have been approximately $2500\text{ }\mu\text{m}$ near the base (6 km MSL) of thick cirrostratus. However, the concentration of these large particles was much less than 1 m^{-3} . The calculated mass (ice water content, IWC) of cirriform clouds sampled has been as great as $5 \times 10^{-2}\text{ g m}^{-3}$ (again, in cirrostratus) but has been more typically one or more orders of magnitude less. In general, our findings agreed with those of Hobbs et al⁴ that ice mass in cirrus tended to increase with increasing temperatures. Since higher saturation vapor contents generally occurred with higher temperatures on these flights, this observation was not unexpected.



Figure 1. Instrumented MC-130E Maintained and Flown by 4950 Test Wing Personnel at Wright-Patterson AFB, Ohio

2. Varley, D. J., and Brooks, D. M. (1978) Cirrus Particle Distribution Study, Part 2, AFGL-TR-78-0248, AD A063807.
3. Varley, D. J. (1978) Cirrus Particle Distribution Study, Part 3, AFGL-TR-78-0305, AD A066975.
4. Hobbs, P. V., Radke, L. F., and Atkinson, D. G. (1975) Airborne Measurements and Observations in Cirrus Clouds, Univ. of Washington Sci Rpt. No. 1. Also AFCRL-TR-75-0249, AD A015937.



KEY:

- | | |
|----------------------------------------------|---------------------------------------------------|
| 1. DEW POINT HYGROMETER PROBE | 10. JW CLOUD WATER PROBE |
| 2. PMS I-D AXIAL SCATTER. PROBE(2-30 μ) | 11. PDP-8/E COMPUTER & LINE PRINTER |
| 3. PMS I-D PRECIP. PROBE(300-4500 μ) | 12. FORMVAR HYDROMETEOR REPLICATOR |
| 4. HYDROMETEOR FOIL SAMPLER | 13. VISUAL HYDROMETEOR PROBE |
| 5. PMS I-D CLOUD PROBE (20-300 μ) | 14. I.N.S. & DOPPLER RADAR |
| 6. TOTAL AIR TEMPERATURE PROBE | 15. AN/APQ-122 K _a & 5CM WEATHER RADAR |
| 7. EWER PROBE | 16. 16mm NOSE CAMERA |
| 8. PMS 2-D PRECIP. PROBE(200-6400 μ) | 17. PROBE LIGHT |
| 9. PMS 2-D CLOUD PROBE (25-800 μ) | 18. TELEMTRY |

Figure 2. Instrumentation on MC-130E S/N 640571

The largest numbers of particles recorded have been in the smallest size range detectable with our current instrument, 1 to 4 μ m. The concentrations of such small sized particles sometimes exceed 10^6 m^{-3} ; however, it is recognized that the Particle Measuring System's (PMS) axial scattering spectrometer probe (ASSP), recording particles in the 1 to 28 μ m range, has inherent deficiencies in making measurements of ice particles. The ASSP was designed to measure spherical water droplets from the amount of scattered, off-axis radiation. It functions well with water drops and is extremely useful in obtaining the small end of size spectra in water clouds. In ice clouds the particles are not spherical and have flat surfaces which produce off-axis scattered radiation, the intensity of which is often angle and orientation dependent and is not necessarily related to the size of the mass of the particles. Scattering from spherical particles can be and has been handled

mathematically, but the scattering from ice crystals of various sizes and shapes has not been successfully treated.

On the other hand there are factors which provide us with some confidence that the measurements taken by the ASSP in ice clouds are mass related. First, the small size and mass of the ice particles means that they are subject to Brownian motion and hence would have random orientation while being detected by the ASSP. If the sample size is large enough and the orientation is truly random, then reasonable size distributions should come from the data. However, if the actual size (true mass) distribution falls off very rapidly with increasing size there is a tendency to flatten the spectral distribution. Second, if the particle is small enough, say less than $6\text{ }\mu\text{m}$, interaction of light waves with the particle can no longer be treated in a classical manner. The sharp edges and corners get smoothed over, and the particles respond more like a spherical particle which is the response desired. Third, the smaller mass particles which have been collected are compact and spherical in shape compared to their larger siblings in the $50\text{ }\mu\text{m}$ and larger range. Fourth, construction of the ASSP is such that scattered light is detected not in just one direction but in an annulus. This collection of the forward scattered light over a fairly large solid angle reduces the angle dependence problem.

For our purposes in the investigation of cirrus clouds, the scattering probe is currently considered the best method of studying the size and mass distributions of small ice particles, therefore the ASSP has been extensively used in these investigations.

The clouds sampled on 21 March were mostly between 24,000 and 27,000 ft (7.3 to 8.3 km) MSL near a fast moving upper level ridge of high pressure. The synoptic weather occurring at the time is described below.

2. SYNOPTIC SITUATION

At the approximate time cirrus particle sampling was being conducted on 21 March most of the U.S. Southwest had only high scattered to overcast cloudiness. The surface pressure gradient, as shown in Figure 3, was weak and did not result in strong winds or any type of storminess. Radar confirmed the absence of precipitation over New Mexico, Colorado, and western Texas.

An area of low pressure at the surface and aloft off the Pacific coast caused considerable rain over California. This, along with lower clouds, spread into Nevada and western Arizona during the day. Central and eastern Arizona, however, had 14,000 to 20,000 ft (4.3 to 6.1 km) ceilings at midday, and most of New Mexico had cloud ceilings at an estimated 20,000 to 30,000 ft (6.1 to 9.2 km).

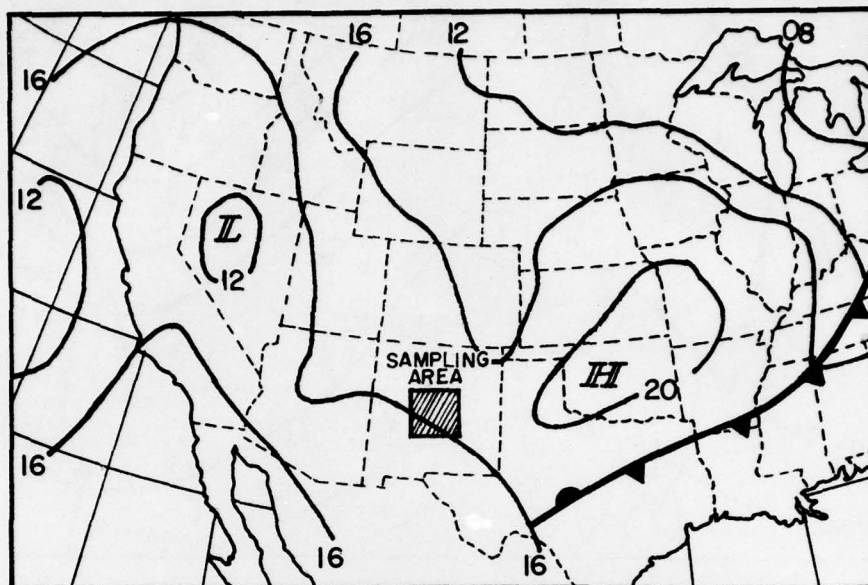


Figure 3. Synoptic Surface Analysis, 1800Z 21 March 1975. Add 1000 to obtain MSL pressure in millibars

The surface front extending over Texas was weak, but an on-shore flow did result in 1000 to 5000 ft (0.3 to 1.5 km) cloud ceilings all along the Texas coast. Most of the central and northern parts of the state had clear skies.

A ridge of high pressure aloft (see Figure 4) from the El Paso area northwestward through Idaho was accompanied by relatively light westerly winds in the lower levels, but, at Albuquerque, these increased to 100 kt at 36,000 ft (11.0 km) at 1200Z.

The 1200Z sounding (Figure 5a) taken at Albuquerque approximately 6 hr before the flight showed the atmosphere to be dry up to 8 km with a moist layer centered near 9 km. This sounding was taken north of the cirrus sampled. Figure 5b shows the sounding taken at 0000Z on 22 March 1978, approximately 6 hr after the flight. By the time of the latter sounding the cirrus layer had spread northward over Albuquerque. In Figure 5b the increase in frostpoint above 6 km is to be noted. The freezing level rose from 3.2 km MSL at 0500L (1200Z) to 3.6 km MSL at 1700L (0000Z) due to diurnal solar surface heating, while the tropopause dropped slightly from 12 km to 11.3 km.

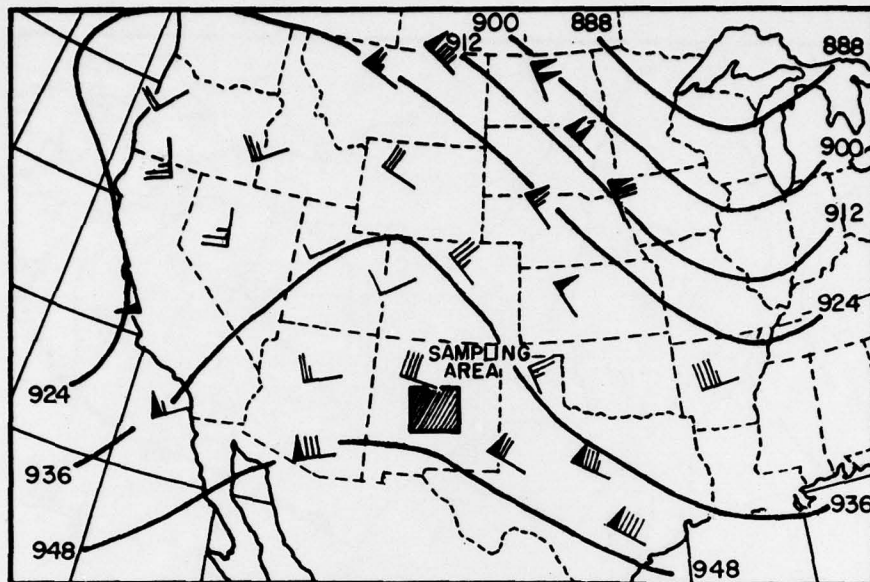


Figure 4. 300 mb Analysis 1200Z, 21 March 1978. Heights in tens of geopotential meters

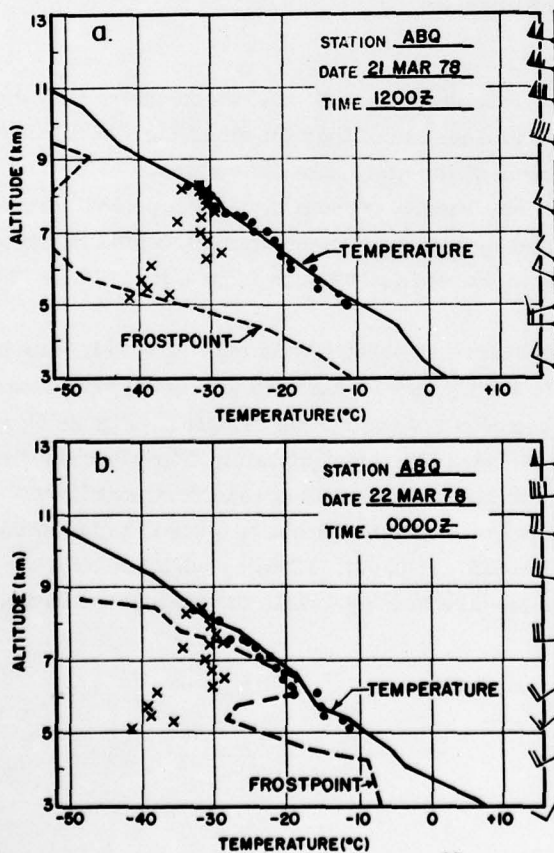


Figure 5. Albuquerque, N. M. Soundings Approximately 6 hr Before (a) and 6 hr After (b) Sampling Flight. Dots and X's represent temperatures and frostpoints measured by sampling aircraft and are identical on both figures. Tropopause was at 12.0 km for (a) and 11.3 km for (b)

The relatively warm, moist air over northern Mexico at levels above 20,000 ft (6.1 km) was associated with the area of high clouds over southern New Mexico that is shown in the two satellite photos in Figures 6 and 7. This cloudiness may have been due partially to the strong wind flow before the upper air trough off Baja, California and partially to orographic motions over the mountains of Mexico. The cirrus was not associated with any major convective activity.

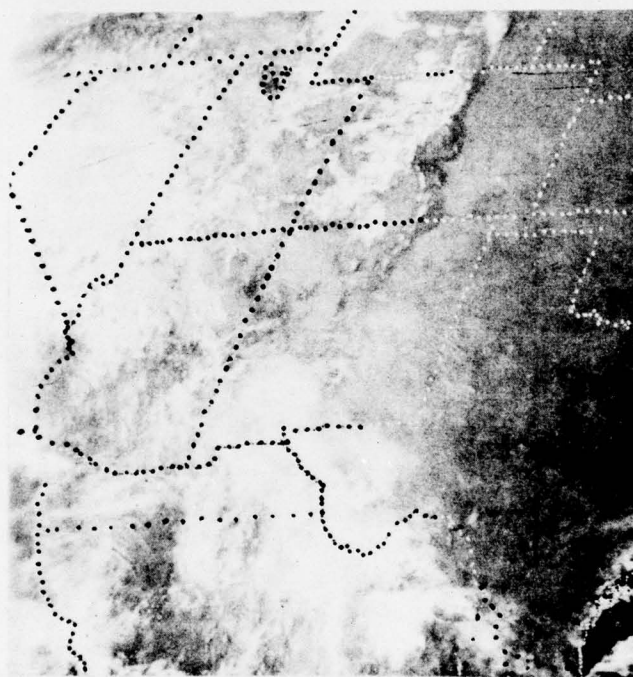


Figure 6. GOES East Visible Picture of New Mexico
21 March 1978, 1902Z. 1 mi resolution

In south-central New Mexico, where most of the sampling was conducted, the aircraft was occasionally on top of the cirrus at 27,000 ft (8.2 km) MSL. The two gray areas surrounded by white on Figure 7 in southern New Mexico represent colder and higher clouds than further north where the sampling was conducted. Cloud tops in that southern area probably extended above 32,000 ft (9.8 km). The 1200Z Albuquerque sounding in Figure 5a also hinted at higher clouds in the small temperature-dewpoint spread near 9 km (29,500 ft).

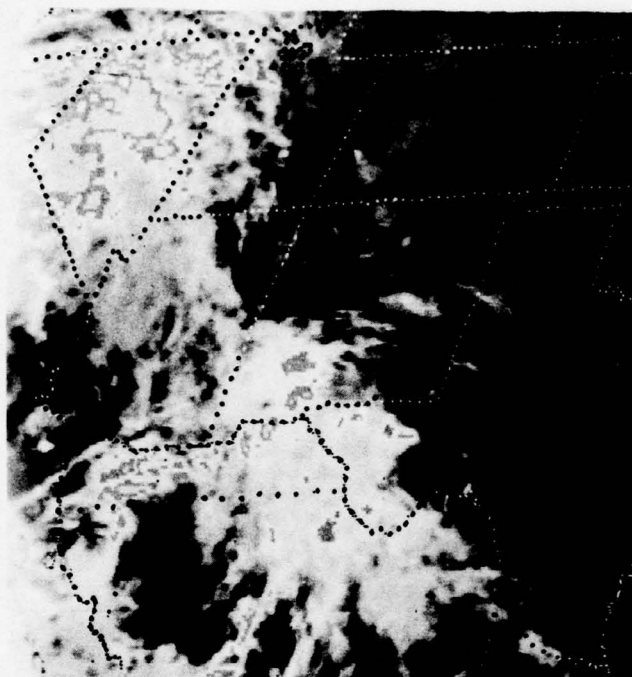


Figure 7. GOES East Infrared Picture 21 March 1978, 1830Z. 1 mi resolution

While the average relative humidity from the surface to 500 mb at 1200Z was 60 percent near Los Angeles and 90 percent over eastern Texas it was a dry 25 to 30 percent over most of New Mexico according to National Meteorological Center.

New Mexico stations near the sampling area reported the following surface weather observations at about the time the sampling was being conducted.

Table 1. Surface Weather Observations

Time	Station	Height of Clouds (100's ft/km)	Visibility (mi/km)	Temperature (°F/C)	Dewpoint (°F/C)	Wind (dir/kt/m sec ⁻¹)
1700Z	Albuquerque	250/7.6 OVC*	60/97	57/14	28/-2	220/03/1
1800Z	Truth or Consequences	120/3.7 SCT 250/7.6 OVC*	50/80	66/19	25/-4	010/07/4
1800Z	Roswell	300/9.1 SCT*	40/64	72/22	38/+3	140/14/7
1900Z	Albuquerque	250/7.6 BKN*	60/97	67/19	27/-3	180/06/3

* Indicates thin overcast, broken, or scattered clouds.

3. THE FLIGHT

The instrumented MC-130E departed Kirtland AFB at Albuquerque at 1700Z (1000L) on 21 March, climbed and flew the track shown in Figure 8. The altitude of the aircraft and variation of outside air temperature with time are represented in Figure 9.

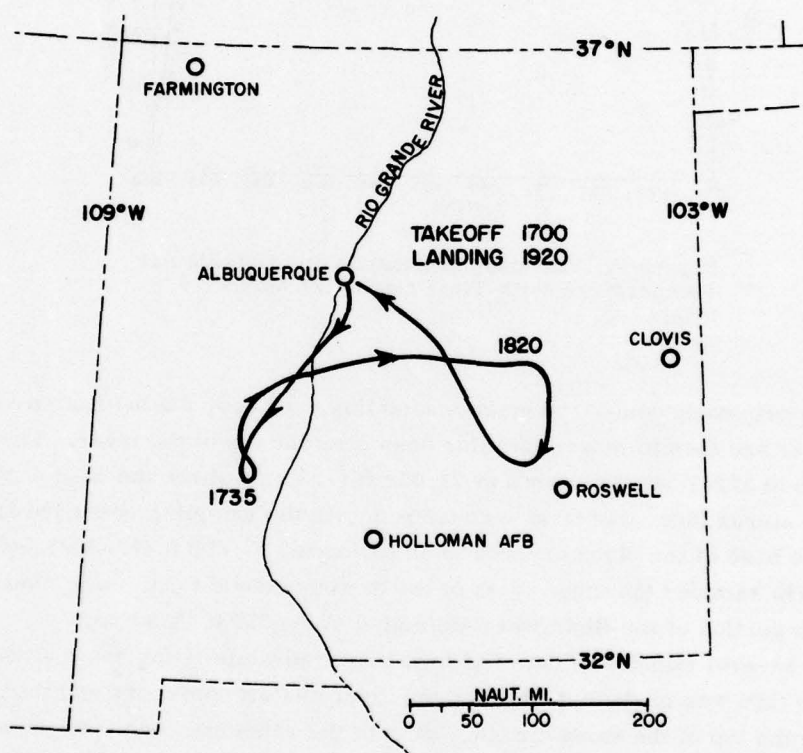


Figure 8. Flight Track of the Sampling Aircraft on 21 March 1978 over New Mexico. Times are given in Universal Time (Z); subtract 7 hr to obtain Mountain Standard Time, the local time

A few cumulus clouds between approximately 10,000 ft and 15,000 ft (3.0 and 4.6 km) were seen near the mountainous terrain, but the higher cirrus clouds were most extensive. The cirrus varied considerably in coverage and density with generally more being seen further south.

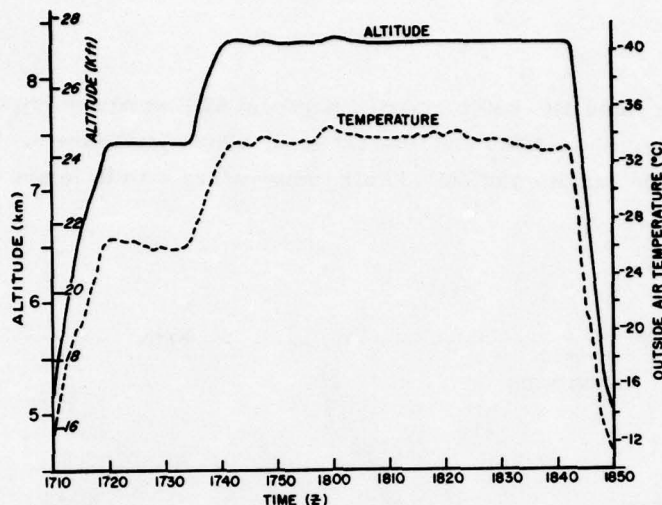


Figure 9. Variation of Altitude and Outside Air Temperature With Time During 21 March 1978 Flight

It was originally desired to make a sampling pass near the base of an extended cirrus layer and then to make a similar pass near the top of the layer. The initial pass began at 1720Z and was flown at 24,000 ft (7.3 km) where the base of a relatively thin cirrus layer was first encountered. As the sampling continued at this altitude the base of the cloud lowered to an estimated 23,000 ft (7.0 km), so the aircraft also sampled the inner parts of the extended cloud form. The cloud tops during this portion of the flight were estimated at 27,000 ft (8.2 km).

After several minutes of data had been acquired while flying south at 24,000 ft, a climbing turn was made at 1735Z and the aircraft flew northward and then eastward near the top of the same cirrus. Most of the remainder of the flight was at 27,000 ft, where the tops were initially located (at 1742Z). At this altitude the aircraft was in and out of the cirrus, which occasionally reached from 28,000 to 29,000 ft (8.5 to 8.8 km).

Figures 10 through 14 are photographs of cloud conditions at various times through the flight. Some of these were taken during the intervals for which data have been averaged in Figures 18 through 23 and in Appendix A. The original color prints from which these were produced contained more detail; however, the extent of the gray or white shades corresponds to the extent or density of the cirrus being studied. The darker shades reflect cloud-free areas.



Figure 10. Photo at 1729Z, 24,000 ft MSL. Thin cirrus at and above aircraft level resulting in halo around sun

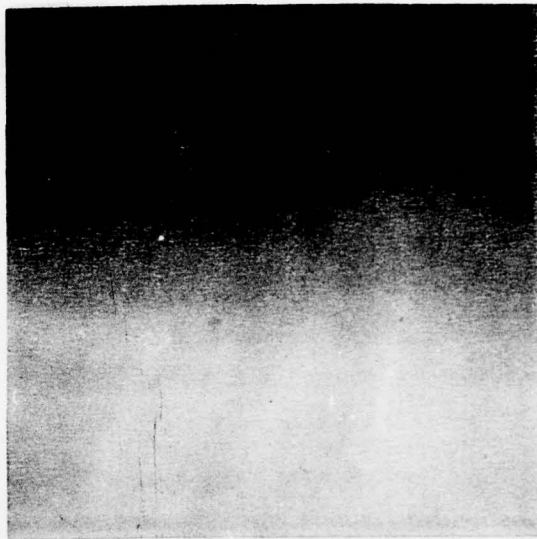


Figure 11. Photo at 1743Z, 27,000 ft MSL. Looking toward horizon. In thin cirrus tops. Dark at top is blue sky



Figure 12. Photo at 1754Z, 27,000 ft MSL. Large area of cirrus about 2 mi from aircraft. Rio Grande valley below

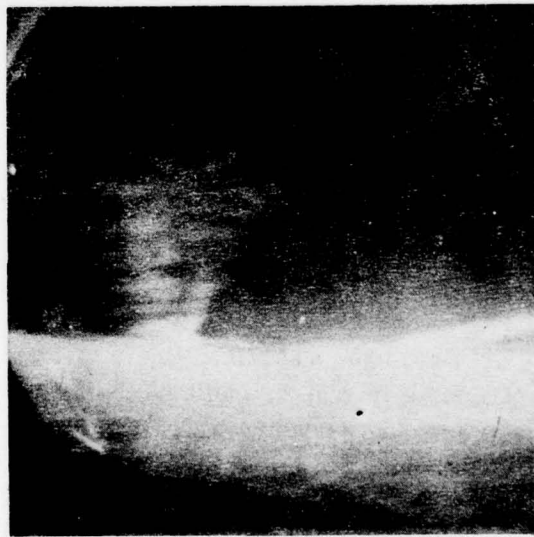


Figure 13. Photo at 1804Z, 27,000 ft MSL. In very thin cirrus with larger cirrus mass in distance. Dissipating contrail above



Figure 14. Photo at 1830Z, 27,000 ft MSL. Good visibility with contrail and few cumulus clouds in background. Dark blue sky above

A halo around the sun was seen several times when there was a thin veil of cirrus above the aircraft. Figure 10 shows an example of this optical phenomenon. Similar to Glass and Varley's⁵ findings involving halo-producing cirrus, the typical crystals on this mission were a mixed type which contained many bullet rosettes. Ice particle types and concentrations will be further discussed in the following section.

An example of the several times when the aircraft sampled the wispy cirrus cloud tops is shown in Figure 11. The thin cirrus at aircraft level became even more tenuous with altitude, fading into blue sky, in this case within a few hundred feet above the aircraft.

Figures 12, 13, and 14 reflect occasions when sampling was continuing in what visually appeared to be cloud-free air, although larger masses of cirrus were a few miles distant and thin cirrus was seen in all directions. In these cases the IWC values were low but some small and a few large ice crystals were detected. The

5. Glass, M., and Varley, D.J. (1978) Observations of cirrus particle characteristics occurring with halos. In Preprints of Conference on Cloud Physics and Atmospheric Electricity, Amer. Meteor. Soc. pp. 126-128. Also, AFGL-TR-78-0196, AD AO59389

contrails in Figures 13 and 14 were approximately 10,000 ft (3 km) above flight altitude and, although the MC-130E flew beneath them only very briefly, it was not possible to identify any increased particle concentrations in the area under the contrails.

After more thin cirrus clouds were sampled north of Roswell, the aircraft returned to Kirtland AFB to conclude the mission at 1920Z (1220L).

Outside air temperatures recorded by the aircraft were in close agreement with the Albuquerque 22 March, 0000Z temperature sounding as shown in Figure 5b. The coldest temperature, approximately -34°C , was recorded at the highest level attained during the flight, 27,300 ft (8.3 km) MSL. The altimeter setting used during the cirrus sampling was 29.92 in. of mercury and all heights were taken from the altimeter.

4. DATA DESCRIPTION

The spectrometer equipment used in counting and sizing particles on this flight consisted of the PMS axial scattering spectrometer probe (ASSP), 1-D cloud, 1-D precipitation, 2-D cloud and 2-D precipitation probes. The 1-D cloud and precipitation probes size particles according to channel dimensions, which vary according to particle type. After a review of the PMS 2-D data, consisting of "shadowgraphs" of particles, it was found that only about 10 percent of the particles could be classified and most of these were of the bullet rosette (or cluster of bullets) type. Examination of the aircraft formvar replicator film with a stop-motion movie projector also indicated large numbers of irregularly shaped particles and relatively few that could be recognized. Figure 15 is an example of bullet rosettes captured in the formvar. The foil impactor instrument was not operated on this flight.

The decision as to the most common particle type at any specified time was seldom easy to make since very few 2-D shadows resembled classical, pristine ice particles—even using Magono and Lee's⁶ wide ranging particle classification. This finding of very few pristine crystals, but of large numbers of aggregates and irregular crystals in cirrus clouds is similar to what has been observed in our previous flights.

The 1-D data were eventually processed using the equations described below for bullet rosettes and small snow during the following portions of the flight (see Table 2).

6. Magono, C., and Lee, C.W. (1966) Meteorological classification of natural snow crystals, Jour Faculty of Sci. Hokkaido Univ. 2,4(Series VII):321-361.

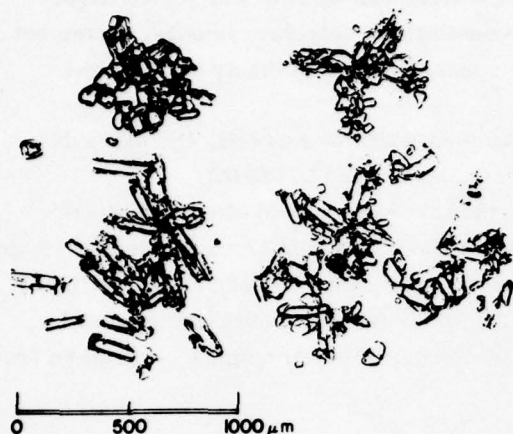


Figure 15. Examples of Bullet Rosettes and Columns Collected by Formvar Hydrometeor Replicator (Item 12 in Figure 2) in Cirrus Clouds

Table 2. Predominant Crystal Types Observed

Time	Type
1716:00 through 1723:59	Small snow
1724:00 through 1749:59	Bullet rosettes
1750:00 through 1757:59	Small snow
1758:00 through 1837:29	Bullet rosettes
1837:30 through 1850:00	Small snow

Cunningham⁷ has previously described the AFGL use of the small snow particle category. It is essentially an aggregate less than $\sim 750 \mu\text{m}$ in its largest dimension.

The determination of the proper particle type (small snow, large snow, bullet rosettes, plates, and so on) affects the calculated equivalent melted diameter of each particle, and, in turn, its contribution to the overall ice water-content. The calculation of equivalent melted diameter for each channel of the cloud and precipitation probes involves three steps.

The first step, channel number adjustment, is a function of particle type and channel number:

$$\text{Adjusted Ch. No. (H)} = M \times \text{Indicated Ch. No.} + B.$$

The AFGL values of M (slope) and B (intercept) for the two particle types of present concern are given in Table 3.

7. Cunningham, R. M. (1978) Analysis of particle spectral data from optical array (PMS) 1-D and 2-D sensors. In Preprints of AMS Fourth Symposium on Meteorological Observations and Instrumentation, Amer. Meteor. Soc.

Table 3. Values Used to Obtain Adjusted Channel Number

	M	B
Small snow	1.15	0.18
Bullet rosettes	1.02	0.32

The second step, crystal size determination, is a function of probe parameters only and is obtained by the following:

$$\text{Crystal Size (L)} = \text{Adjusted Ch. No. (H)} \times \text{Probe diode width.}$$

Finally, the equivalent melted diameter of each channel for each probe is given by

$$\text{Diameter (D)} = a \times L^b \text{ (mm)}$$

where the values of a and b (after Cunningham)⁷ are given in Table 4.

Table 4. Values Used to Obtain Equivalent Melted Diameter

	a	b	Breakpoint (L in μm)
Small Snow	0.40	0.78	LE 500
Small Snow	0.37	0.67	GT 500
Bullet Rosette	0.26	0.67	LE 200
Bullet Rosette	0.44	1.00	GT 200

Examples of small snow and bullet rosettes, as seen on 2-D shadowgraphs, are shown in Figure 16. On each line of that figure the particles shown were recorded consecutively from left to right. The exact time duration of any line is dependent on particle concentration. Blank data between particles are not recorded, but the time between particles is known. The diversity of shapes on this figure is readily apparent even from one particle to the next. As a result, several of the lines on the figure that are cited as having predominantly small snow or bullet rosettes also display one or more other particle types.

The vertical lines in Figure 16 represent a height of 800 μm and may be used in judging both the horizontal and vertical dimensions of the particles to their right. Most of the small snow recorded in the first line (at 1721:04Z) appears to be about 100 to 200 μm in size, while some of the bullet rosettes on following lines are close to 800 μm .

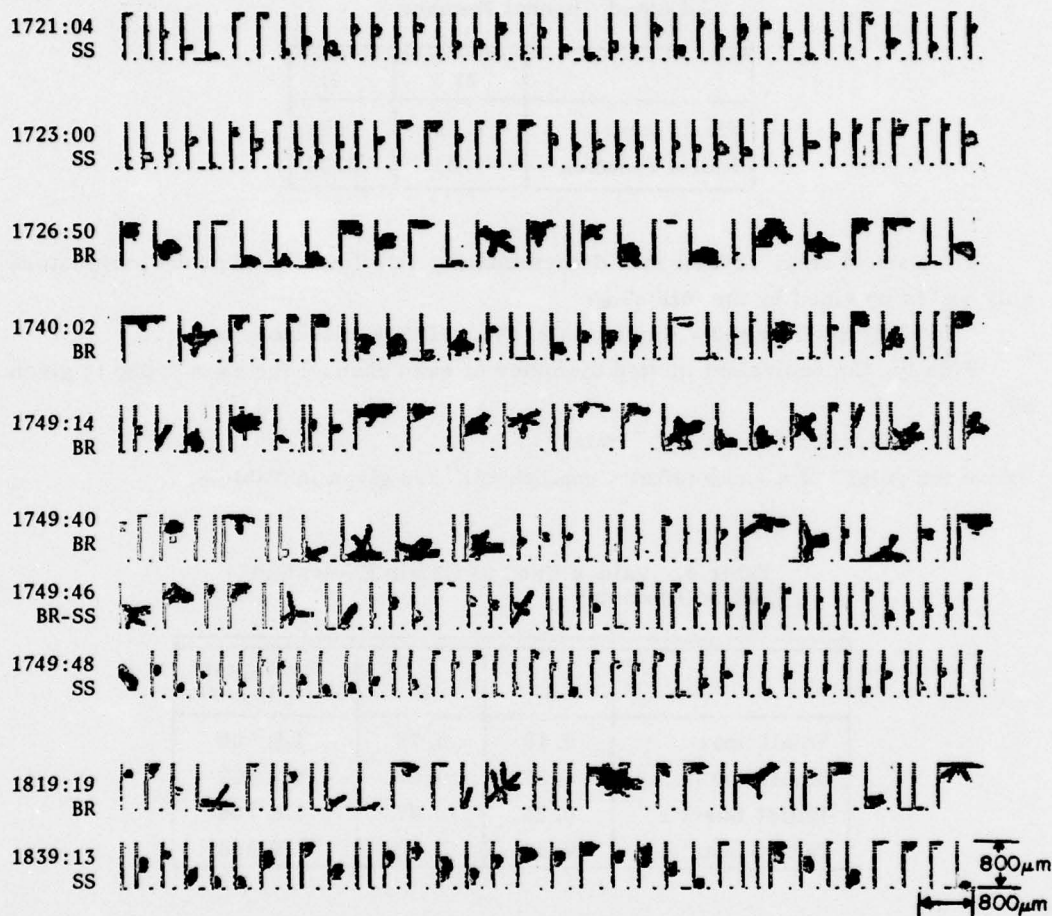


Figure 16. Examples of PMS 2-D Particle Shadowgraphs From 21 March 1978 Flight. Each line shows examples of small snow (SS) or bullet rosettes (BR) recorded at about the indicated Universal Time

The lines in Figure 16 recorded at 1749:40, 1749:46, and 1749:48 are taken from consecutive records in the 2-D data printout. They are of interest in showing over the course of just a few seconds time a significant change in particle type from bullet rosettes to small snow. The aircraft was moving through the air at approximately 120 m/sec at this time.

Based on the particle types for the times given above the PMS 1-D data printouts in Appendices A and B were prepared. These provide detailed listings of the data acquired averaged over certain 6- or 12-min periods in Appendix A and over

consecutive 30-sec periods in Appendix B. As previously indicated, the format of these listings is described in Reference 1.

Figure 17 is a record of the variation with time of ice water content during the sampling as determined by the PMS axial scattering, 1-D cloud and 1-D precipitation probes. The number and sizes of the ice crystals in the atmosphere are not only responsible for ice water content at any given time, but they also relate to the range of visibility. (See the work of Chylek⁸ and Pinnick et al⁹ correlating the extinction of light with the liquid water content of the atmosphere.) For this reason higher values of ice water content, particularly those determined from the precipitation probe, are frequently accompanied by lower visibilities.

At the top of Figure 17 a few of the notes (from the mission director's taped comments) bear out this correlation. For example, at 1725Z, when the IWC of the precipitation probe was relatively high, the mission director indicated he could barely see the ground below, and that the horizontal visibility was down to 2 to 3 miles. But at about 1800Z when the IWC was much less the notes indicate the aircraft was above most of the cirrus and that conditions were reported as being only slightly hazy.

The variation of visibility with IWC appeared to correlate best with that of the precipitation probe, less with that of the cloud probe and only poorly or not at all with the IWC determined from the scattering probe measurements. This, in turn, probably is an indication that it is the larger particles recorded by the precipitation probe that contribute most to the restriction of visibility.

According to the bottom portion of Figure 17 the 1 to 28 μm particles measured by the scattering probe varied only slightly whether a visible cloud was present or not. The scatter probe IWC first exceeded 10^{-4} g m^{-3} at about 1717Z when the aircraft was climbing above 23,000 ft (7.0 km) and the temperature was -23C. It fell below 10^{-4} g m^{-3} when the airplane descended below 21,000 ft (6.4 km) and the temperature warmed to -21C.

The scattering probe continued to detect cirrus particles throughout the sampling profile while the aircraft remained above a small anomaly in the temperature profile which was at roughly 22,000 ft. Even when the mission director reported the aircraft to be between layers or on top of the cirrus, the scattering probe was detecting "sub-visible cirrus." We attribute these continual high values from the scattering probe to the sub-visible cirrus in the moist, high level tropical air in the upper level trough.

8. Chylek, P. (1978) Extinction and liquid water content of fogs and clouds, Jour. of Atmos. Sci. 35:296-300.

9. Pinnick, R.G., Hoihjelle, D.L., Fernandez, G., Stenmark, E.B., Lindberg, J.D., Hoidale, G.B., and Jennings, S.G. (1978) Vertical structure in atmospheric fog and haze and its effects on visible and infrared extinction, Jour. Atmos. Sci. 35:2020-2032.

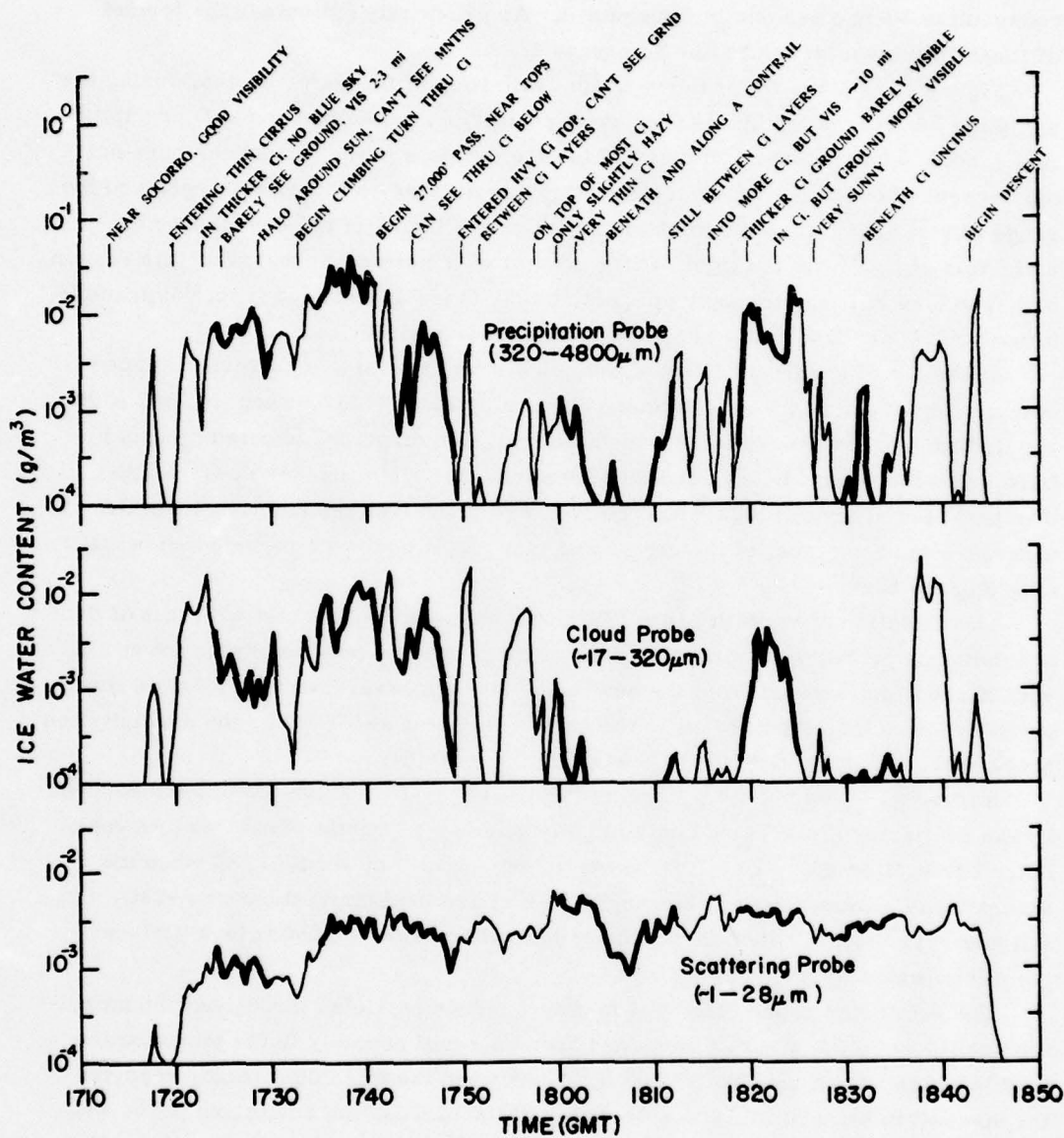


Figure 17. Variation of Ice Water Content During 21 March 1978 Flight. Variation was determined from PMS probes measuring 3 portions of the ice particle spectrum. Darker parts of lines reflect the 6 periods given in Table 1 for which data were averaged and further processed.

After reviewing the mission director's notes, the variation of IWC in Figure 17 and the nose camera movie film, 6 periods during the flight were selected to examine in more detail. The results of this examination are found in the averaged data on Figures 18 through 23, which also provide short descriptions of the cirriform cloud from which they were obtained. Essentially, periods were chosen that had relatively homogeneous cloud conditions for at least a 6-min duration. These example periods, which are also indicated on Figure 17, are listed in Table 5. Some of the photographs presented earlier were taken at times during the example periods.

The heights of the vertical lines in the 2-D example portions of Figures 18 through 23 are 800 μm . The average particle spectrum for the time period is shown on the graph at the bottom of each figure. These spectra have been normalized by determining the number concentration values per mm of sampling probe bar width. This, in effect, allowed comparison of data obtained by different probes even though their sampling parameters were not the same.

Of the six examples the one given in Figure 19 displayed the largest total ice water content over the range that was sampled by the cloud and precipitation probes. (See "C+P" values on Figures 18 through 23.) That pass sample was acquired while the aircraft was climbing through relatively dense cirrus between 24,000 and 27,000 ft (7.3 to 8.2 km). The next greatest C+P ice water content measurement (of the six considered here) is given in Figure 22 and was a result of flight through the tops of some higher cirrus protrusions.

Of the six examples those shown in Figures 21 and 23 had the smallest IWC's as determined by both the 1-D cloud and precipitation probes. The data for these times were recorded when the aircraft was in nearly cloud-free conditions or was between cirrus layers. Even at these times, however, a small number of crystals as large as 1300 μm were recorded. The source of these is not clear, although in some cases they have fallen from higher cirrus layers.

The largest ice crystals measured when the aircraft was skimming through the tops of wispy cirrus from 1743 to 1748Z (see Figure 20) were also about 1300 μm , but in that case the number of particles in the 100 to 500 μm range was 1 to 2 orders of magnitude greater than the "cloud-free" cases of Figures 21 and 23. Occasional cirrus filaments above the aircraft during the 1743-1748Z pass probably produced most of these large crystals at the top of this cirrus layer.

TYPE: BULLET ROSETTE

ALTITUDE 7.4 km

TEMPERATURE -26.1 °C

	SCATTER	PROBE CLOUD(C)	PRECIP(P)	C + P
ICE WATER CONTENT (g m^{-3})	7.51×10^{-4}	1.50×10^{-3}	7.19×10^{-3}	8.69×10^{-3}
MED. VOL. DIAMETER (μm)	19	121	229	211

EXAMPLE 2-D PARTICLE FORMS



COMMENTS: In moderately dense cirrus which extended about 1000 ft below to 3000 ft above sampling level (24,000). Blue sky not visible above, although a halo was around the dimly shining sun. Ground barely visible below. Many well developed bullet rosettes.

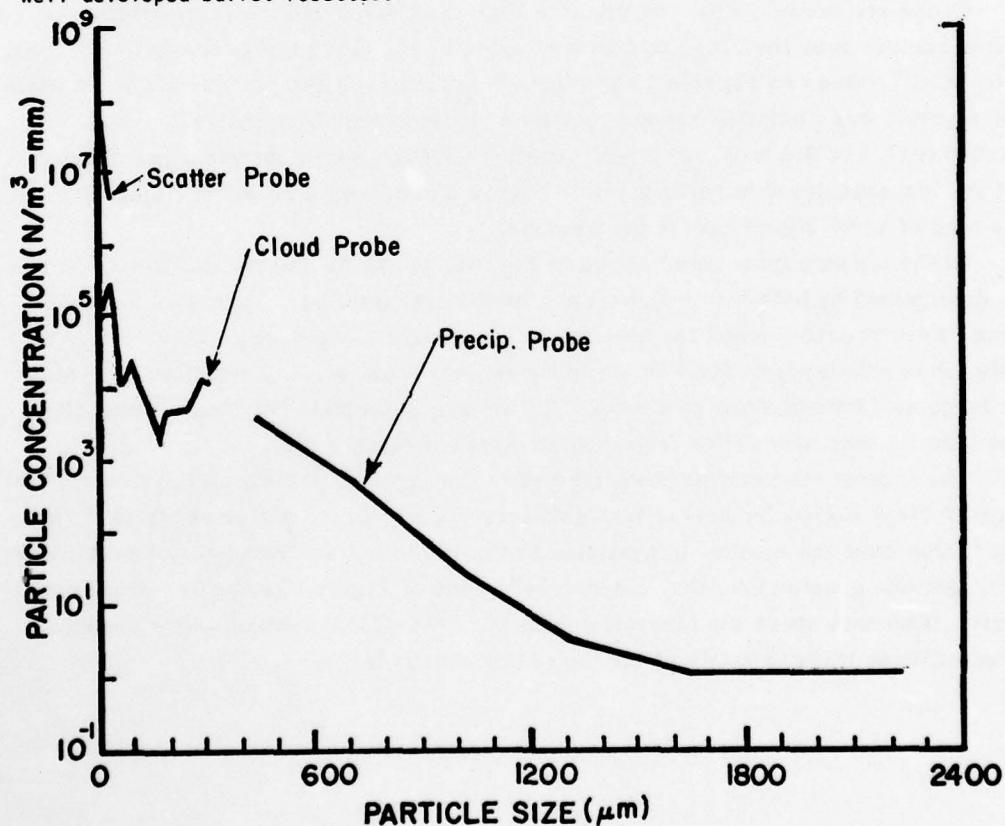


Figure 18. Cirrus Particle Data Averaged From 1724 Through 1729Z
21 March 1978

TYPE: BULLET ROSETTE

ALTITUDE 7.9 km

TEMPERATURE -29.7 °C

	SCATTER	PROBE CLOUD(C)	PRECIP(P)	C + P
ICE WATER CONTENT (g m^{-3})	1.99×10^{-3}	7.83×10^{-3}	2.30×10^{-2}	3.09×10^{-2}
MED. VOL. DIAMETER (μm)	19	117	218	192

EXAMPLE 2-D PARTICLE FORMS

1735:49Z



1739:17Z



COMMENTS: Aircraft climbing from 24,000 to 27,000 ft through dense cirrus. Ice water content of precipitation probe reached maximum for flight.

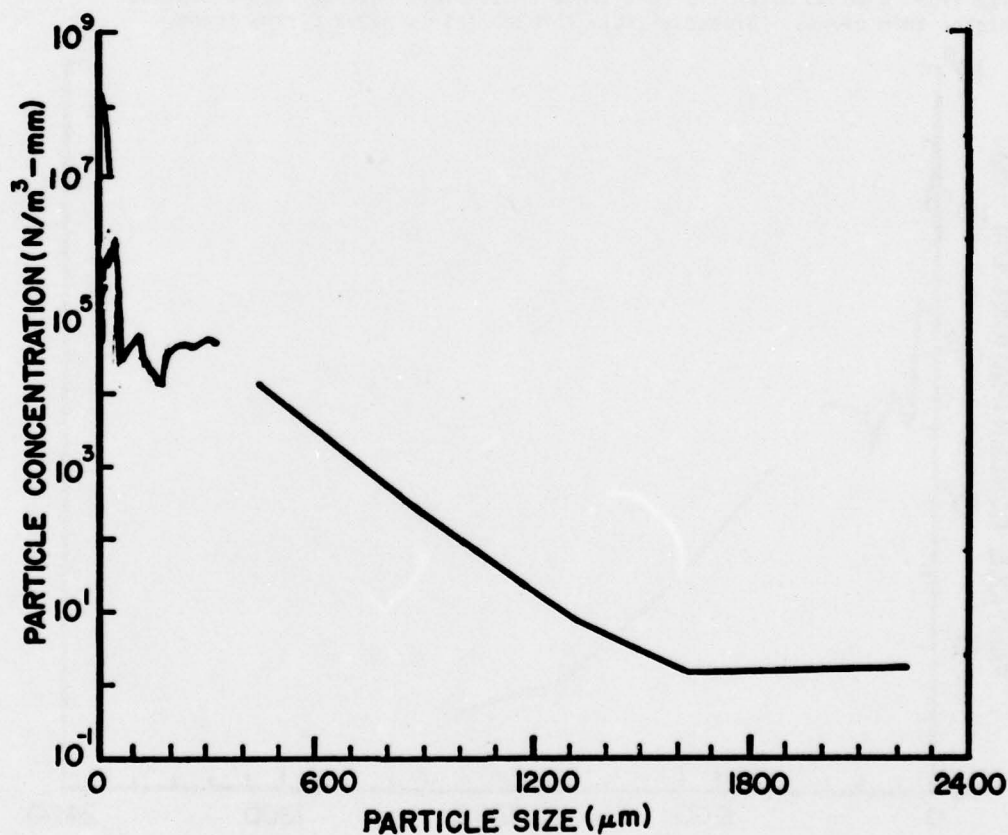


Figure 19. Cirrus Particle Data Averaged From 1735 Through 1740Z
21 March 1978

TYPE: BULLET ROSETTE

ALTITUDE 8.4 km

TEMPERATURE -33.5 °C

	SCATTER	PROBE CLOUD(C)	PRECIP(P)	C + P
ICE WATER CONTENT (g m^{-3})	1.78×10^{-3}	3.08×10^{-3}	3.58×10^{-3}	6.67×10^{-3}
MED. VOL. DIAHETER (μm)	19	115	199	149

EXAMPLE 2-D PARTICLE FORMS



COMMENTS: Skimming through tops of wispy cirrus. Horizontal visibility varied from ~4 to 50 miles. Bright sun with distinct halo through occasional higher thin cirrus. Ground visible through fairly heavy cirrus below.

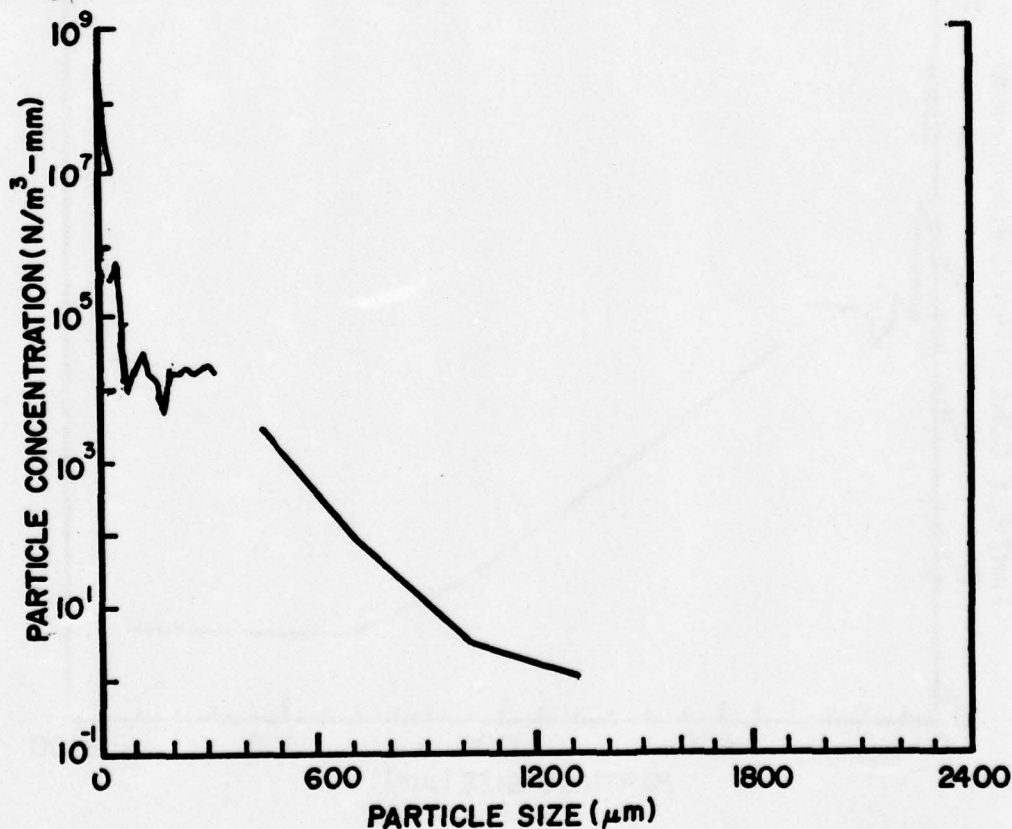


Figure 20. Cirrus Particle Data Averaged From 1743 Through 1748Z
21 March 1978

TYPE: BULLET ROSETTE

ALTITUDE 8.3 km

TEMPERATURE -34.0 °C

	SCATTER	PROBE CLOUD(C)	PRECIP(P)	C + P
ICE WATER CONTENT (g m^{-3})	2.10×10^{-3}	9.21×10^{-5}	3.82×10^{-4}	4.75×10^{-4}
MED. VOL. DIAMETER (μm)	19	123	220	201

EXAMPLE 2-D PARTICLE FORMS

1801:25Z

1811:19Z



COMMENTS: Above most cirrus, although another thin layer was above aircraft. Visibility only slightly reduced by very thin cirrus at flight level. Contrail well above. Ground visible most of the time.

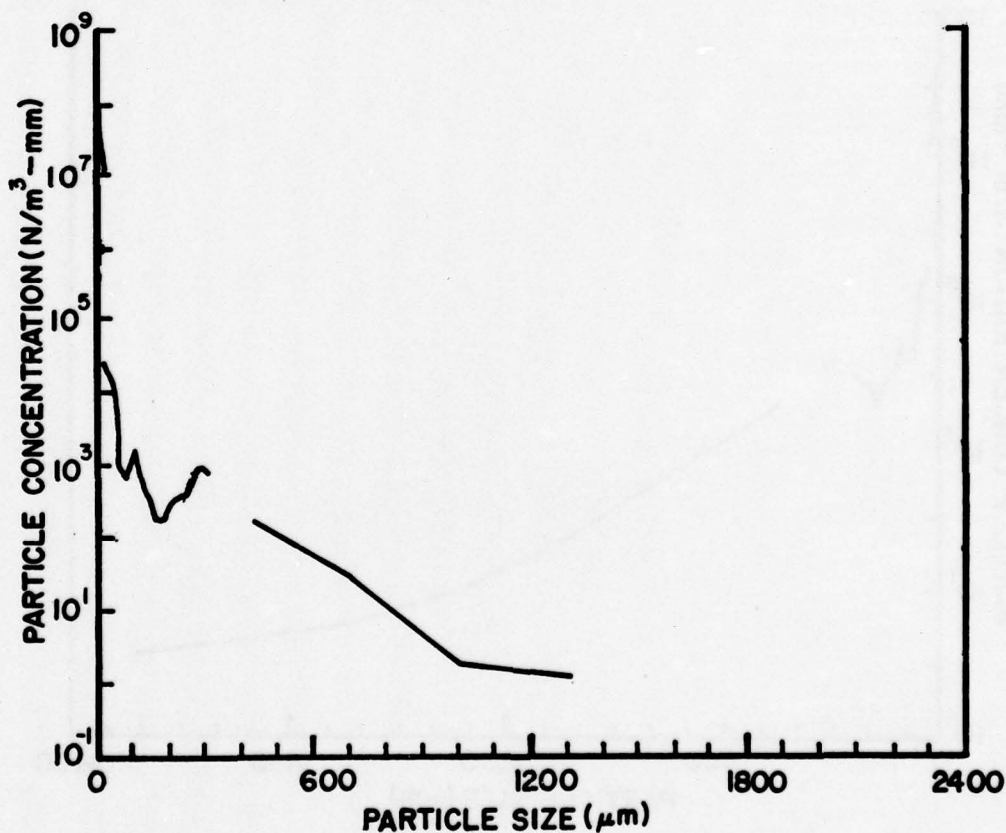


Figure 21. Cirrus Particle Data Averaged From 1800 Through 1811Z
21 March 1978

TYPE: BULLET ROSETTE

ALTITUDE 8.4 km

TEMPERATURE -34.0 °C

	SCATTER	PROBE CLOUD(C)	PRECIP(P)	C + P
ICE WATER CONTENT (g m^{-3})	2.61×10^{-3}	1.79×10^{-3}	8.77×10^{-3}	1.06×10^{-2}
MED. VOL. DIAMETER (μm)	20	119	238	218

EXAMPLE 2-D PARTICLE FORMS



COMMENTS: Passing through higher cirrus tops. In gray, milky cloud. Hint of blue sky above, but mostly gray cloud. Ground visible through hazy cirrus below. Occasional distinct halo around sun. Many well formed bullet rosettes.

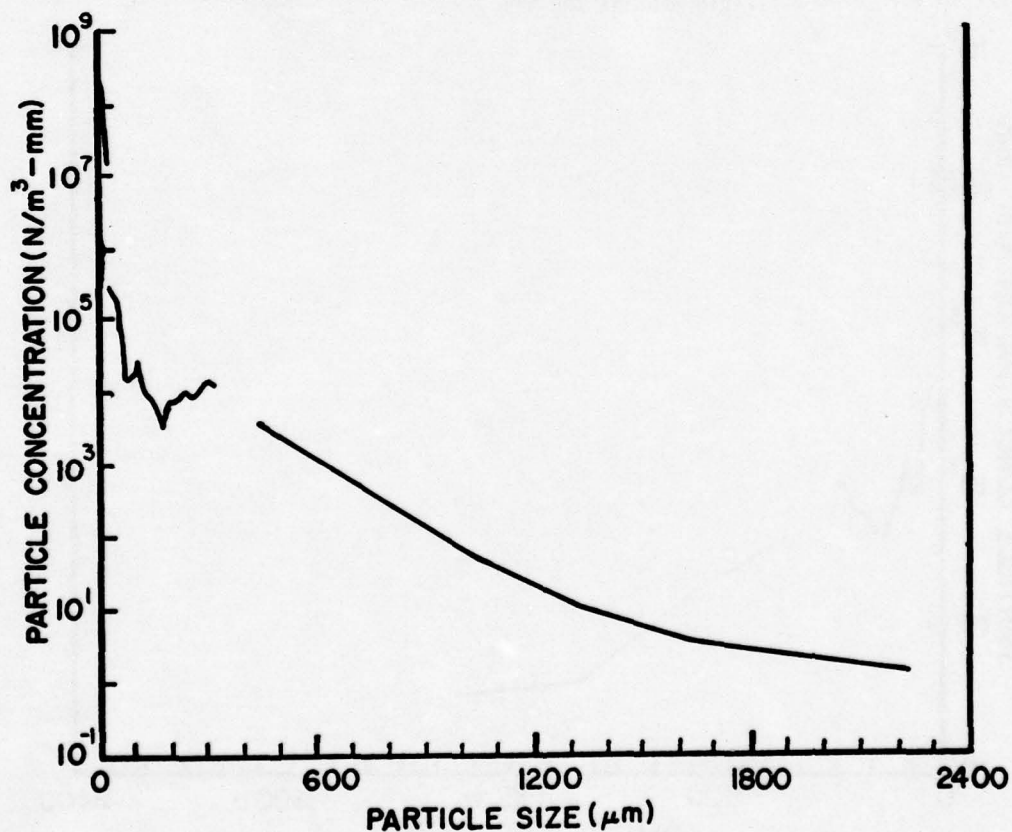


Figure 22. Cirrus Particle Data Averaged From 1819 Through 1824Z
21 March 1978

TYPE: BULLET ROSETTE

ALTITUDE 8.3 km

TEMPERATURE -33.4 °C

	SCATTER	PROBE CLOUD(C)	PRECIP(P)	C + P
ICE WATER CONTENT (g m^{-3})	1.97×10^{-3}	6.28×10^{-5}	3.78×10^{-4}	4.40×10^{-4}
MED. VOL. DIAMETER (μm)	18	108	265	244

EXAMPLE 2-D PARTICLE FORMS

1831:24Z

1834:57Z



COMMENTS: Initially very sunny with blue skies, then under higher thin cirrus filaments. By and through occasional wispy filaments of cirrus. Total IWC of air was relatively small, although precipitation-probe sized particles were larger than usual.

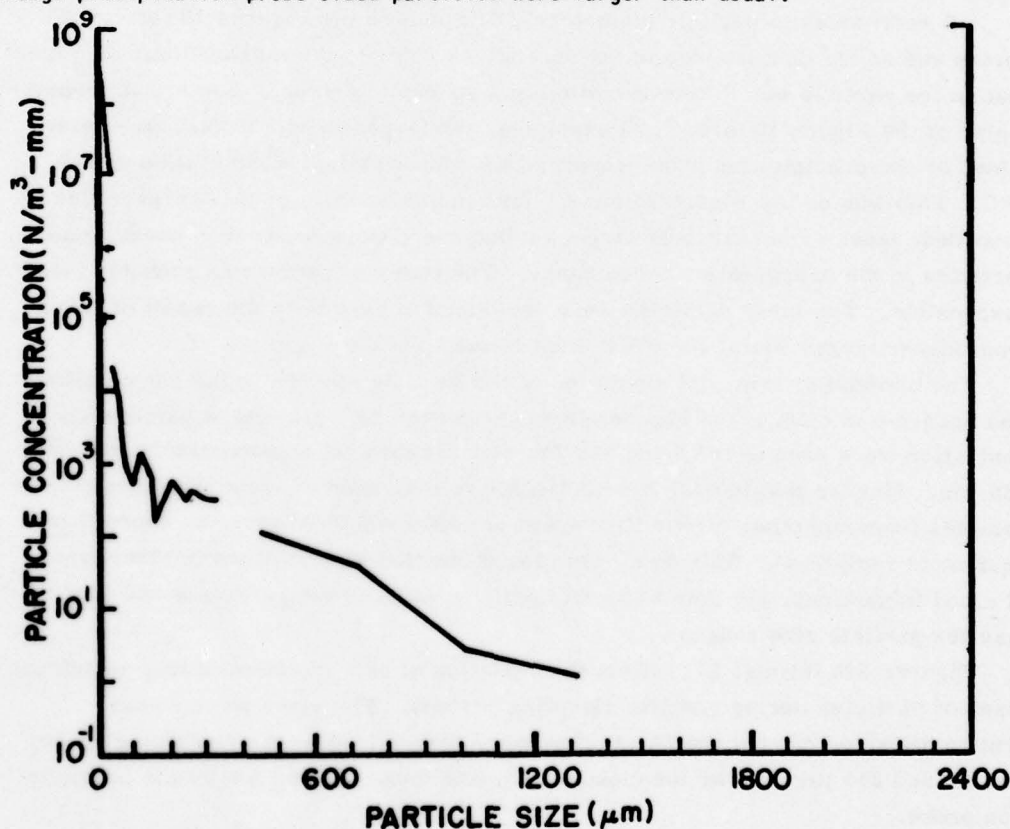


Figure 23. Cirrus Particle Data Averaged From 1829 Through 1834Z
21 March 1978

Table 5. Portions of Flight for Which Data Averages Were Prepared

Example No.	Period (GMT)		Av. Temp (°C)	Alt (km)	C+P IWC* (g/m ³)
1	1724-1729	Base of Ci	-26.1	7.4	8.69×10^{-3}
2	1735-1740	Interior of thick CI	-29.7	7.9	3.09×10^{-2}
3	1743-1748	Tops of Ci	-33.5	8.3	6.67×10^{-3}
4	1800-1811	Thin Ci btwn layers, good visibility	-34.0	8.3	4.75×10^{-4}
5	1819-1824	In thicker Ci tops	-34.0	9.3	1.06×10^{-2}
6	1829-1834	Very thin Ci, good visibility	-33.4	8.3	4.40×10^{-4}

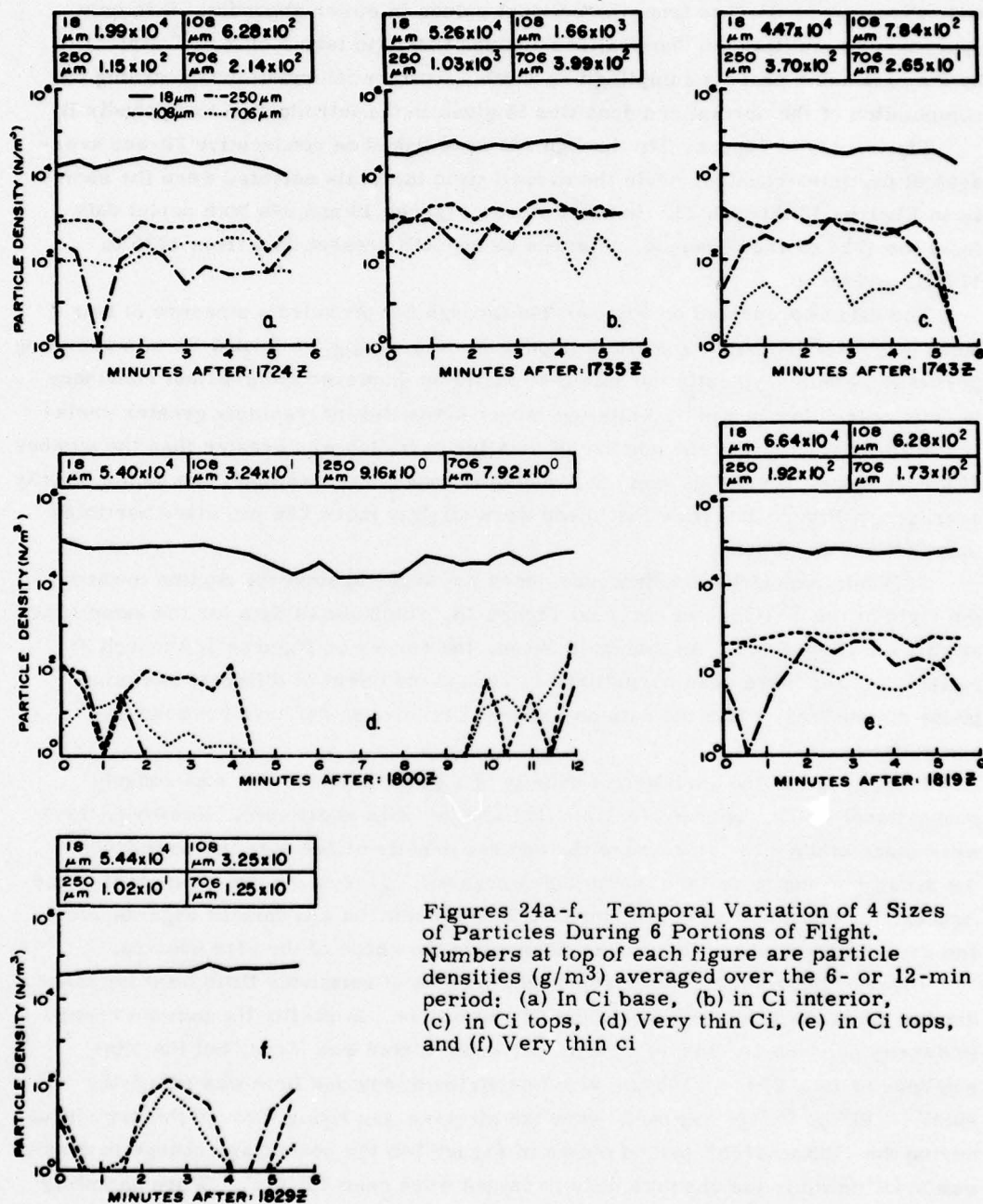
*Ice water content determined by a combination of data from the 1-D cloud and precipitation probes. All six examples were in bullet rosettes.

All references to particle diameters (DIA) on both the Figures 18 through 23 series and on the data listings in the appendices refer to the mean volume diameter that an ice particle would have if melted to a spherical droplet. Somewhat surprisingly, of the Figure 18 through 23 examples, the largest mean droplet size determined by the precipitation probe occurred with the smallest precipitation-probe IWC. This was on the Figure 23 case. This indicates that, of the few particles recorded, most were relatively large, or that there were fewer than usual smaller particles in the precipitation probe range. The latter situation was probably most responsible. The large particles were concluded to have been the result of fallout from higher cirrus filaments which were reported at the time.

The bimodal or trimodal character of the particle spectra in the cloud probe was apparent in each of the Figures from 18 through 23. Minima in particle concentration were seen near 70 and 170 μm with maxima at approximately 100 and 250 μm . Similar multimodal distributions have been seen at about the same size in samples from our other cirrus flights and are believed to be real, as opposed to equipment variations. Eldridge¹⁰ also found bimodal distributions in other types of cloud formations, but they were primarily at warmer temperatures and in the smaller particle size ranges.

Figures 24a through 24f reflect the variation of concentration of four individual sizes of particles during specific sampling periods. The sizes were rather arbitrarily selected, but the 18 μm data were determined by the scattering probe, the 108 and 250 μm data by the cloud probe, and those for 706 μm by the precipitation probe.

10. Eldridge, R.G. (1966) Haze and fog aerosol distributions, Jour. Atmos. Sci. 23:605-613.



Similar particle density data in terms of number per cubic meter for any particle size may be derived from the printout values in either appendix. It is only necessary to multiply the "normalized" values there (in terms of $N m^{-3} mm^{-1}$) by the particular probe's sampling bar width. Further information concerning the computation of the normalized densities is given in the introduction to Appendix B.

The curves in Figures 24a through 24f were based on consecutive 30-sec averages of particles counted, while the overall time intervals selected were the same as in Figures 18 through 23. In other words Figures 18 and 24a both depict data from the 1724 to 1729Z period. Figures 19 and 24b present data from 1735 to 1740Z, and so on.

The data represented on Figures 24a through 24f provided a measure of how homogeneous or constant a particle population was during the 6- and 12-min sampling period selected. Typically the smallest particles displayed the greatest constancy in density (number per m^3), while the larger sizes had increasingly greater variation with time. Usually the number of smaller particles was greater than the number of larger ones, though this was not always the case. For example, the 6-min density averages in Figure 24a show that there were slightly more 706 μm sized particles than 250 μm sized ones.

This latter observation, however, does not argue against the decline toward the right of the distribution curve on Figure 18, which shows data for the same time as that for Figure 24a. As indicated above, the curves on Figures 18 through 23 reflect data that have been normalized to reduce the effect of different sampling probe dimensions, while the data on Figures 24a through 24f have not been so normalized.

In many cases the variation of density of a given particle size was roughly proportional to the changes with time that another size underwent. However, there were many other situations where the number density of one size increased while the density of another size of particles decreased. This is evident in several of the figures, notably the first few minutes of 250 μm and 706 μm data on Figures 24b and 24e. In these cases there were changes in the shape of the size spectra.

Figures 24d and 24f, which represent periods of relatively little total ice mass, display great variation of particle density with time. In reality the percent change in density between 10^0 and 10^2 counts per cubic meter was large, but the total numbers of 108, 250, or 706 μm sized particles at any one time was relatively small ($\leq 10^2 m^{-3}$). In contrast, when the airplane was flying through thicker cirrus during the 1735 to 1740Z period shown in Figure 24b the percentage change in density was smaller while the absolute density values were near $10^3 m^{-3}$. When sampling small numbers of particles in visibly cloud-free air it may be occasionally difficult to obtain sufficient data over short periods to produce results which are statistically

significant, however, it is believed that sufficient data were obtained during the flight so that there were no problems due to limited sampling.

5. CONCLUDING COMMENTS

The MC-130E flight on 21 March 1978 was successful in acquiring a large amount of particle information in the cirrus clouds that were sampled near Albuquerque and in the south-central portion of New Mexico. The cirrus appeared to be related to jet stream winds and was not associated with a surface weather system.

Initially the flight was to be made at a specific altitude near the base of an extended cirrus sheet and then was to be continued at another altitude near the cirrus tops. Because of the variation in vertical depth of the cirrus along the flight route the aircraft actually flew in and out of the clouds, both near the bases and the tops. The resulting variation in the size and number of particles recorded during the flight can be deduced from the variation in computed ice water content values that are shown in Figure 17.

From a review of PMS 2-D particle "shadowgraphs" and of formvar replicator film it was apparent that the type of particle that could be most frequently identified was the bullet rosette (or cluster of bullets), although during short periods the predominant type was classified as "small snow". By far the majority of individual ice crystals defied typing in any text-book classification and could only be considered to be in an "irregular" category.

The greatest cloud mass was determined during a period (1735 to 1740Z) when the sampling aircraft was ascending through an area of cirrus approximately 4000 ft thick. Review of the 30-sec data averages in Appendix B indicates ice water contents as high as $4.5 \times 10^{-2} \text{ g m}^{-3}$. The largest particles actually recorded at that time were approximately 2200 μm in their largest dimension.

In a few of the cirrus particle spectra plotted in Parts 1¹ and 2² of this report series there were indications of a maximum in the density curve at sizes between approximately 250 and 300 μm . Such a maximum was seen in each of the spectra in Figures 18 through 23. Some of the other spectra in the previous parts, however, show little or no indication of a larger number of particles near 250 μm than on either side. Since meteorological parameters and visible cloud properties appeared to be very similar whether the particle maximum occurred or did not, the significance of its presence remains unclear.

Particles were detected by the ASSP almost continuously above 7 km. During sampling in sub-visible cirrus, distant cirrus clouds could be seen and there were occasional visible cirrus clouds or contrails above the aircraft. Maximum particle

sizes detected in the sub-visible cirrus were 1300 μm . In at least some cases the particles seemed to be settling from higher cirrus filaments. The aircraft did not top the sub-visible cirrus as it did on the 18th of March 1978 while on another mission over New Mexico. On the 18th a climb was made to 9.8 km. Above 9.7 km there was a substantial drop in the number of particles detected (see Figures 5 and 6 in Reference 3) indicating that the equipment was functioning properly and that the cirrus had been topped.

Mixed crystal types with the predominant type being bullet rosettes were recorded during a period when a halo was observed.

Estimates of forward visibility seemed to correlate better with the IWC values from the 1-D precipitation probe, that is, a large number of large particles, than with any of the other measured parameters.

In the cirrus sampled the maximum IWC values decreased with height as was expected.

The original data printouts of particle number vs size from which the plots in Figures 18 through 23 and 24a through 24f have been developed are given in Appendix A. Particle spectra data for consecutive 30-sec intervals through most of the flight are presented in Appendix B.

References

1. Varley, D.J. (1978) Cirrus Particle Distribution Study, Part 1, AFGL-TR-78-0192, AD A061485.
2. Varley, D.J., and Brooks, D.M. (1978) Cirrus Particle Distribution Study, Part 2, AFGL-TR-78-0248, AD A063807.
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10. Eldridge, R.G. (1966) Haze and fog aerosol distributions, Jour. Atmos. Sci. 23:605-613.

Appendix A

Average Particle Distributions for Selected Time Periods

Particle concentration data are given in the following pages for selected 6- or 12-min periods during the 21 March 1978 sampling flight when cloud conditions were relatively homogeneous. Portions of these data are shown in Figures 18 through 23. Values derived from these printouts are plotted in Figures 24a through f.

The method of calculating unnormalized particle densities from the normalized values in these printouts is described in the introduction to Appendix B.

Average particle distribution (No./m³-mm) for the 6 minute period beginning at 1724Z. Data plotted on Figure 15. Near base of cirrus. Bullet rosettes.

SIZE (μ)	SCATTER PROBE	SIZE (μ)	CLOUD PROBE	SIZE (μ)	PRECIP PROBE	P (MB)
2	6.76E+05	26	1.97E+05	437	4.82E+03	388.0
3	2.80E+07	47	4.81E+05	736	5.48E+02	ALT (KM)
5	4.90E+07	67	1.03E+04	1011	2.68E+01	7.398
7	5.45E+07	97	2.12E+04	1316	1.90E+00	TEMP (C)
9	4.43E+07	103	3.14E+04	1622	5.54E-02	-26.1
11	3.39E+07	123	1.23E+04	1927	1.77E-01	
12	2.58E+07	143	7.84E+03	2233	1.88E-01	
14	2.35E+07	169	4.13E+03	2538	0.	FROSTPOINT
16	1.95E+07	189	6.25E+03	2843	0.	
18	1.12E+07	209	5.14E+03	3149	0.	
19	8.76E+06	231	7.02E+03	3454	0.	TAS (M/S)
21	6.69E+06	251	5.74E+03	3760	0.	114.9
23	6.76E+06	271	9.51E+03	4065	0.	
25	5.20E+06	291	1.58E+04	4370	0.	
27	4.43E+06	311	1.34E+04	4676	0.	
IWC	7.51E-04		1.50E-03		7.19E-03	TOTALS
MED D	19		121		229	8.69E-03
						211

Average particle distribution (No./m³-mm) for the 6 minute period beginning at 1735Z. Data plotted on Figure 16. Thick cirrus. Bullet rosettes.

SIZE (μ)	SCATTER PROBE	SIZE (μ)	CLOUD PROBE	SIZE (μ)	PRECIP PROBE	P (MB)
2	7.55E+07	26	6.71E+05	437	1.76E+04	360.4
3	1.85E+08	47	1.95E+06	736	1.33E+03	ALT (KM)
5	1.73E+08	67	3.56E+04	1011	9.39E+01	7.915
7	1.46E+08	87	5.78E+04	1316	6.65E+00	TEMP (C)
9	1.09E+08	103	8.30E+04	1622	4.36E-01	-29.7
11	8.39E+07	123	3.23E+04	1927	6.91E-01	
12	5.79E+07	143	2.35E+04	2233	6.13E-01	
14	5.98E+07	169	1.65E+04	2538	0.	FROSTPOINT
16	4.99E+07	189	4.09E+04	2843	0.	
18	2.95E+07	209	5.35E+04	3149	0.	
19	2.14E+07	231	6.38E+04	3454	0.	TAS (M/S)
21	1.85E+07	251	5.14E+04	3760	0.	117.3
23	1.87E+07	271	6.08E+04	4065	0.	
25	1.67E+07	291	7.20E+04	4370	0.	
27	1.51E+07	311	5.92E+04	4676	0.	
IWC	1.99E-03		7.83E-03		2.30E-02	TOTALS
MED D	19		117		218	3.09E-02
						192

Average particle distribution (No/m³-mm) for the 6 minute period beginning at 1743Z. Data plotted on Figure 17. Cirrus tops. Bullet rosettes.

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
						338.7
2	1.84E+08	26	3.92E+05	437	3.67E+03	
3	2.17E+08	47	7.54E+05	706	8.82E+01	ALT (KM)
5	1.71E+08	67	1.05E+04	1011	2.66E+00	8.339
7	1.29E+03	87	2.46E+04	1316	9.82E-02	
9	3.05E+07	103	3.92E+04	1622	0.	TEMP (C)
11	7.21E+07	123	1.93E+04	1927	0.	-33.5
12	5.37E+07	143	1.59E+04	2233	0.	
14	5.19E+07	169	8.84E+03	2538	0.	FROSTPOINT
16	4.55E+07	189	2.19E+04	2843	0.	-33.3
18	2.51E+07	209	2.27E+04	3149	0.	
19	1.93E+07	230	2.49E+04	3454	0.	TAS (M/S)
21	1.55E+07	250	1.85E+04	3760	0.	121.8
23	1.57E+07	271	2.27E+04	4065	0.	
25	1.57E+07	291	2.78E+04	4370	0.	
27	1.23E+07	311	2.10E+04	4676	0.	
IWC	1.78E-03		3.08E-03		3.58E-03	TOTALS
MED D	19		115		199	6.67E-03
						149

Average particle distribution (No/m³-mm) for the 12 minute period beginning at 1800Z. Data plotted on Figure 18. Very thin cirrus, good visibility. Bullet rosettes.

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
						339.0
2	4.17E+08	26	2.50E+04	437	2.88E+02	
3	3.13E+08	47	1.51E+04	706	2.64E+01	ALT (KM)
5	2.30E+08	67	1.09E+03	1011	7.55E-01	8.333
7	1.65E+08	87	6.50E+02	1316	9.96E-02	
9	1.19E+03	103	1.62E+03	1622	0.	TEMP (C)
11	8.04E+07	123	5.45E+02	1927	0.	-34.0
12	6.43E+07	143	3.44E+02	2233	0.	
14	6.42E+07	159	1.77E+02	2538	0.	FROSTPOINT
16	5.86E+07	189	1.91E+02	2843	0.	-33.1
18	3.03E+07	209	3.73E+02	3149	0.	
19	2.44E+07	230	4.12E+02	3454	0.	TAS (M/S)
21	1.86E+07	250	4.58E+02	3760	0.	121.2
23	1.75E+07	271	6.51E+02	4065	0.	
25	1.63E+07	291	1.04E+03	4370	0.	
27	1.34E+07	311	9.70E+02	4676	0.	
IWC	2.10E-03		9.21E-05		3.83E-04	TOTALS
MED D	19		123		220	4.75E-04
						201

Average particle distribution (No/m³-mm) for the 6 minute period beginning at 1819Z. Data plotted on Figure 19. In cirrus tops. Bullet rosettes.

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
						338.8
2	4.32E+08	26	3.67E+05	437	5.33E+13	
3	3.13E+08	47	2.38E+05	706	5.76E+02	ALT (KM)
5	2.27E+08	67	1.72E+04	1011	6.19E+11	8.337
7	1.67E+08	87	1.92E+04	1316	1.02E+11	
9	1.19E+08	119	3.14E+04	1622	2.64E+10	TEMP (C)
11	9.35E+07	129	1.10E+04	1927	1.21E+10	-34.0
12	6.67E+07	149	8.02E+03	2233	3.49E-11	
14	7.21E+07	159	3.82E+03	2538	0.	FROSTPOINT
16	6.19E+07	189	9.52E+03	2843	0.	
18	3.73E+07	209	9.81E+03	3149	0.	
19	2.92E+07	231	1.30E+04	3454	0.	TAS (M/S)
21	2.28E+07	251	9.60E+03	3760	0.	123.9
23	2.41E+07	271	1.31E+04	4065	0.	
25	2.40E+07	291	1.79E+04	4370	0.	
27	2.15E+07	311	1.51E+04	4676	0.	
						TOTALS
IWC	2.61E-03		1.79E-03		8.77E-13	1.06E-02
MED D	20		119		239	218

Average particle distribution (No/m³-mm) for the 6 minute period beginning at 1829Z. Data plotted on Figure 20. Very thin cirrus, good visibility. Bullet rosettes.

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
						339.5
2	5.21E+08	26	2.67E+04	437	1.83E+12	
3	3.22E+08	47	6.21E+03	706	4.17E+11	ALT (KM)
5	2.27E+08	67	1.09E+03	1011	1.60E+10	8.324
7	1.62E+08	87	6.49E+02	1316	9.92E-12	
9	1.17E+08	119	1.63E+03	1622	0.	TEMP (C)
11	8.93E+07	129	8.77E+02	1927	0.	-33.4
12	6.27E+07	149	1.73E+02	2233	0.	
14	6.84E+07	169	3.56E+02	2538	0.	FROSTPOINT
16	5.54E+07	189	6.94E+02	2843	0.	
18	3.06E+07	209	5.02E+02	3149	0.	
19	2.37E+07	230	3.70E+02	3454	0.	TAS (M/S)
21	1.69E+07	250	5.12E+02	3760	0.	121.4
23	1.63E+07	271	4.55E+02	4065	0.	
25	1.42E+07	291	4.02E+02	4370	0.	
27	1.71E+07	311	3.61E+02	4676	0.	
						TOTALS
IWC	1.97E-03		6.28E-05		3.78E-14	4.40E-04
MED D	18		108		265	244

Appendix B

Average Particle Distributions for 30-Second Periods

The following pages provide cloud particle concentration data as a function of particle size for the time on 21 March 1978 when the sampling aircraft was flying at approximately 24,000 and 27,000 ft (7.3 and 8.2 km). Data averages are given for consecutive 30-sec periods from 1716 through 1850Z.

For particular portions of the flight the data were processed using AFGL equations for two different particle types. The times and types are:

1716:00 - 1723:59Z	Small snow
1724:00 - 1749:59Z	Bullet rosettes
1750:00 - 1757:59Z	Small snow
1758:00 - 1837:29Z	Bullet rosettes
1837:30 - 1850:00Z	Small snow

Any of the normalized particle distribution figures in the appendix, with units of number/m³-mm, may be converted to unnormalized number/m³, by multiplying by the following number of millimeters.

PROBE

	Scatter	Cloud	Precip. (except smallest size)	Precip. (smallest size)
Small snow	1.8×10^{-3}	2.3×10^{-2}	3.4×10^{-1}	2.1×10^{-1}
Bullet rosettes	1.8×10^{-3}	2.0×10^{-2}	3.1×10^{-1}	2.3×10^{-1}

For example, for the distributions beginning at 1717:00Z, which was processed as "small snow", the unnormalized density of $49\text{ }\mu\text{m}$ sized particles is $(1.78 \times 10^4/\text{m}^3\text{-mm}) \cdot (2.3 \times 10^{-2}\text{mm}) = 4.1 \times 10^2/\text{m}^3$.

AFML CIRRHUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS: 17:16:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: SMALL SNOW

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	P (MB)	P (MB)	P (MB)
2	1.41E+07	26	0.	465	0.	424.1	424.1
3	0.	49	0.	743	0.	ALT (KM)	ALT (KM)
5	0.	72	0.	1088	0.	6.767	6.767
7	0.	95	0.	1433	0.	TEMP (C)	TEMP (C)
9	0.	118	0.	1778	0.	-21.6	-21.6
11	0.	141	0.	2123	0.	FROSTPOINT	FROSTPOINT
12	0.	164	0.	2468	0.	-23.8	-23.8
14	0.	187	0.	2813	0.	TAS (M/S)	TAS (M/S)
16	0.	210	0.	3158	0.	110.9	110.9
18	0.	233	0.	3503	0.	TOTALS	TOTALS
19	0.	256	0.	3848	0.	0.	0.
21	0.	279	0.	4193	0.	0	0
23	0.	302	0.	4538	0.	0	0
25	0.	325	0.	4883	0.	0	0
27	0.	348	0.	5228	0.	0	0
INCL	1.23E-07	0.	0	0	0.	0	0
MEQ D	2	0.	0	0	0	0	0

AFML CIRRHUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS: 17:17:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: SMALL SNOW

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	P (MB)	P (MB)	P (MB)
2	1.81E+07	26	3.38E+04	465	3.23E-01	413.3	413.3
3	9.02E+05	49	1.78E+04	743	5.16E-01	ALT (KM)	ALT (KM)
5	1.50E+06	72	0.	1088	0.	6.950	6.950
7	3.01E+05	95	0.	1433	0.	TEMP (C)	TEMP (C)
9	0.	118	0.	1778	0.	-22.8	-22.8
11	1.20E+06	141	1.25E+03	2123	0.	FROSTPOINT	FROSTPOINT
12	0.	164	0.	2468	0.	-24.7	-24.7
14	0.	187	1.63E+03	2813	0.	TAS (M/S)	TAS (M/S)
16	0.	210	8.78E+02	3158	0.	112.5	112.5
18	3.01E+05	233	9.59E+02	3503	0.	TOTALS	TOTALS
19	0.	256	1.09E+03	3848	0.	1.30E-04	1.30E-04
21	0.	279	0.	4193	0.	120	120
23	6.01E+05	302	0.	4538	0.	0.	0.
25	0.	325	0.	4883	0.	0.	0.
27	0.	348	0.	5228	0.	0.	0.
INCL	1.10E-05	23	1.27E-04	120	3.12E-06	293	293
MEQ D	0	0	0	0	0.	0	0

INTERVAL STARTS: 17:16:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: SMALL SNOW

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	P (MB)	P (MB)	P (MB)
2	1.73E+07	26	0.	465	0.	418.6	418.6
3	0.	49	0.	743	0.	ALT (KM)	ALT (KM)
5	0.	72	0.	1088	0.	6.860	6.860
7	0.	95	0.	1433	0.	TEMP (C)	TEMP (C)
9	0.	118	0.	1778	0.	-22.2	-22.2
11	0.	141	0.	2123	0.	FROSTPOINT	FROSTPOINT
12	0.	164	0.	2468	0.	-25.1	-25.1
14	0.	187	0.	2813	0.	TAS (M/S)	TAS (M/S)
16	0.	210	0.	3158	0.	111.8	111.8
18	0.	233	0.	3503	0.	TOTALS	TOTALS
19	0.	256	0.	3848	0.	0.	0.
21	0.	279	0.	4193	0.	0	0
23	0.	302	0.	4538	0.	0	0
25	0.	325	0.	4883	0.	0	0
27	0.	348	0.	5228	0.	0	0
INCL	1.51E-07	0.	0	0	0.	0	0
MEQ D	2	0.	0	0	0	0	0

INTERVAL STARTS: 17:17:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: SMALL SNOW

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	P (MB)	P (MB)	P (MB)
2	7.22E+06	26	3.39E+04	465	1.07E+03	409.3	409.3
3	1.05E+07	49	2.49E+05	743	2.06E+02	ALT (KM)	ALT (KM)
5	1.53E+07	72	4.18E+03	1088	4.91E+01	7.037	7.037
7	8.71E+04	95	2.49E+03	1433	1.25E+01	TEMP (C)	TEMP (C)
9	9.31E+06	118	1.02E+04	1778	4.79E+00	-23.6	-23.6
11	5.71E+06	141	1.26E+03	2123	0.	FROSTPOINT	FROSTPOINT
12	7.21E+06	164	4.94E+03	2468	0.	-24.3	-24.3
14	4.50E+06	187	4.07E+03	2813	0.	TAS (M/S)	TAS (M/S)
16	3.30E+06	210	4.40E+03	3158	0.	112.8	112.8
18	2.70E+06	233	3.04E+03	3503	0.	TOTALS	TOTALS
19	1.60E+06	256	5.27E+03	3848	0.	3.05E-03	3.05E-03
21	6.00E+05	279	1.17E+03	4193	0.	294	294
23	2.40E+06	302	1.69E+03	4538	0.	0.	0.
25	1.60E+06	325	2.44E+03	4883	0.	0.	0.
27	9.01E+05	348	2.13E+03	5228	0.	0.	0.
INCL	1.68E-04	20	1.11E-03	133	3.05E-03	4.17E-03	4.17E-03
MEQ D	0	0	0	0	0.	0	0

AFML CIRRUS STUDY 8Y AFGL

FLIGHT 678-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS: 17:10:00
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: SMALL SNOW

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	1.49E+06	26	0.	465	9.79E+02	403.7	2	0.	26	0.	465	0.	393.3
3	2.98E+06	49	1.06E+05	743	1.14E+02		3	2.97E+05	49	0.	743	0.	
5	3.28E+06	72	0.	1088	2.05E+01	7.117	5	2.96E+05	72	0.	1088	0.	ALT (KM)
7	5.37E+06	95	7.39E+03	1433	4.52E+00		7	0.	95	0.	1433	0.	7.308
9	3.87E+06	118	5.03E+03	1778	1.79E+00	TEMP (C)	9	2.95E+05	118	0.	1778	0.	TEMP (C)
11	5.98E+06	141	3.73E+03	2123	0.	-24.1	11	0.	141	0.	2123	0.	-25.7
12	2.68E+06	164	9.76E+02	2468	0.		12	0.	164	0.	2468	0.	
14	2.09E+06	197	1.61E+03	2813	0.	FROSTPOINT	14	0.	187	0.	2813	0.	FROSTPOINT
16	1.49E+06	210	1.74E+03	3158	0.	-25.3	16	0.	210	0.	3158	0.	-25.4
18	1.49E+06	233	0.	3503	0.		18	0.	233	0.	3503	0.	
19	1.49E+06	256	3.13E+03	3848	0.	TAS (M/S)	19	0.	256	0.	3848	0.	TAS (M/S)
21	1.49E+06	279	1.15E+03	4193	0.	113.8	21	2.96E+05	279	0.	4193	0.	114.6
23	1.49E+06	302	1.33E+03	4538	0.		23	0.	302	0.	4538	0.	
25	5.98E+05	325	2.88E+03	4883	0.		25	0.	325	0.	4883	0.	
27	2.99E+05	348	2.41E+03	5228	0.	TOTALS	27	0.	348	0.	5228	0.	TOTALS
IMC	9.65E-05		7.60E-04		2.00E-03	2.75E-03	IMC	3.11E-06		0.		0.	0.
MED D	20		154		257	227	MED D	21		0		0	0

AFML CIRRUS STUDY 9Y AFGL

FLIGHT 678-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS: 17:19:00
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: SMALL SNOW

INTERVAL STARTS: 17:10:00
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: SMALL SNOW

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	5.93E+05	26	3.33E+04	465	2.49E+02	393.6	2	5.27E+06	26	0.	465	0.	397.8
3	2.08E+06	49	1.50E+05	743	0.		3	3.79E+06	49	6.70E+03	743	0.	
5	2.97E+06	72	0.	1088	0.	ALT (KM)	5	3.52E+05	72	4.12E+03	1088	0.	7.401
7	3.57E+06	95	2.46E+03	1433	0.	7.208	7	1.75E+05	95	2.36E+03	1433	0.	
9	3.57E+06	118	5.02E+03	1778	0.	TEMP (C)	9	1.18E+06	118	3.29E+03	1778	0.	TEMP (C)
11	1.19E+06	141	2.49E+03	2123	0.	-24.9	11	0.	141	0.	2123	0.	-26.4
12	2.09E+06	164	4.90E+03	2468	0.		12	1.16E+06	164	0.	2468	0.	
14	1.49E+06	187	4.84E+03	2813	0.	FROSTPOINT	14	5.89E+05	187	7.78E+02	2813	0.	FROSTPOINT
16	1.19E+06	210	6.09E+03	3158	0.	-25.4	16	2.96E+05	210	0.	3158	0.	-25.9
18	1.19E+06	233	1.90E+03	3503	0.		18	2.89E+05	233	0.	3503	0.	
19	0.	256	1.04E+03	3848	0.	TAS (M/S)	19	5.78E+05	256	0.	3848	0.	TAS (M/S)
21	1.49E+06	279	2.32E+03	4193	0.	114.2	21	0.	279	0.	4193	0.	114.8
23	1.49E+06	302	1.08E+03	4538	0.		23	2.94E+05	302	0.	4538	0.	
25	5.98E+05	325	4.98E+02	4883	0.		25	5.85E+05	325	0.	4883	0.	
27	1.49E+06	348	4.46E+02	5228	0.	TOTALS	27	2.93E+05	348	0.	5228	0.	TOTALS
IMC	8.04E-05		6.86E-04		2.49E-04	9.35E-04	IMC	3.12E-05		4.89E-05		0.	4.89E-05
MED D	24		117		217	136	MED D	23		72		0	72

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS: 17:20:10*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: SMALL SNOW

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MM)
2	8.79E+06	26	6.36E+04	465	0.	387.5
3	2.64E+07	49	1.42E+05	743	0.	ALT (KM)
5	2.21E+07	72	0.	1088	0.	7.405
7	1.87E+07	95	2.11E+04	1433	0.	TEMP (C)
9	1.19E+07	118	1.44E+04	1778	0.	-26.4
11	9.91E+06	141	3.55E+03	2123	0.	FROSTPOINT
12	5.18E+06	164	5.56E+03	2468	0.	-26.4
14	5.39E+06	187	1.53E+03	2813	0.	FROSTPOINT
16	4.53E+06	210	4.13E+03	3158	0.	-26.4
18	1.49E+06	233	1.80E+03	3503	0.	TAS (M/S)
19	0.	256	0.	3848	0.	119.6
21	2.84E+05	279	0.	4193	0.	TOTALS
23	5.66E+05	302	0.	4538	0.	4.87E-04
25	1.90E+06	325	0.	4883	0.	0
27	5.65E+05	348	0.	5228	0.	80
TWC	1.35E-04		4.87E-04		0.	
MED D	16		80			

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS: 17:21:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: SMALL SNOW

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MM)
2	4.47E+06	26	1.57E+05	465	5.45E+03	386.9
3	1.98E+07	49	7.21E+05	743	0.	ALT (KM)
5	2.80E+07	72	7.76E+03	1088	0.	7.416
7	3.97E+07	95	2.08E+04	1433	0.	TEMP (C)
9	3.30E+07	118	2.05E+04	1778	0.	-26.5
11	2.52E+07	141	1.28E+04	2123	0.	FROSTPOINT
12	1.65E+07	164	1.10E+04	2468	0.	-26.2
14	1.59E+07	187	1.97E+04	2813	0.	FROSTPOINT
16	1.51E+07	210	5.72E+04	3158	0.	TAS (M/S)
18	6.98E+06	233	6.05E+04	3503	0.	121.2
19	4.20E+06	256	2.35E+04	3848	0.	TOTALS
21	4.76E+06	279	1.96E+04	4193	0.	5.39E-03
23	4.20E+06	302	1.46E+04	4538	0.	1.27E-02
25	4.76E+06	325	1.09E+04	4883	0.	165
27	2.24E+06	348	9.73E+03	5228	0.	
TWC	4.95E-04		7.30E-03		217	
MED D	18		131			

INTERVAL STARTS: 17:20:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: SMALL SNOW

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MM)
2	8.39E+06	26	6.33E+04	465	6.43E+02	387.0
3	2.05E+07	49	5.65E+05	743	0.	ALT (KM)
5	2.61E+07	72	0.	1088	0.	7.415
7	2.69E+07	95	9.29E+03	1433	0.	TEMP (C)
9	2.38E+07	118	2.05E+04	1778	0.	-26.6
11	1.78E+07	141	1.79E+04	2123	0.	FROSTPOINT
12	1.26E+07	164	2.03E+04	2468	0.	-26.0
14	9.53E+06	187	1.52E+04	2813	0.	FROSTPOINT
16	6.45E+06	210	4.18E+04	3158	0.	-26.0
18	4.49E+06	233	2.32E+04	3503	0.	TAS (M/S)
19	2.53E+06	256	1.18E+04	3848	0.	120.8
21	2.52E+06	279	1.28E+03	4193	0.	TOTALS
23	1.68E+06	302	2.05E+03	4538	0.	3.92E-03
25	1.19E+06	325	1.29E+03	4883	0.	217
27	1.69E+06	348	1.15E+03	5228	0.	119
TWC	2.70E-04		3.20E-03		6.34E-04	
MED D	17		119		217	

INTERVAL STARTS: 17:21:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: SMALL SNOW

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MM)
2	5.04E+06	26	1.89E+05	465	4.31E+03	387.0
3	1.43E+07	49	9.54E+05	743	0.	ALT (KM)
5	2.21E+07	72	7.79E+03	1088	0.	7.415
7	3.31E+07	95	1.62E+04	1433	0.	TEMP (C)
9	3.61E+07	118	3.15E+04	1778	0.	-26.5
11	2.52E+07	141	2.22E+04	2123	0.	FROSTPOINT
12	1.54E+07	164	2.39E+04	2468	0.	-25.8
14	1.26E+07	187	2.27E+04	2813	0.	FROSTPOINT
16	1.78E+07	210	5.56E+04	3158	0.	TAS (M/S)
18	7.00E+06	233	5.09E+04	3503	0.	121.0
19	5.88E+06	256	3.44E+04	3848	0.	TOTALS
21	2.52E+06	279	1.42E+04	4193	0.	4.27E-03
23	2.80E+06	302	1.11E+04	4538	0.	217
25	3.36E+06	325	8.61E+03	4883	0.	150
27	3.64E+06	348	7.69E+03	5228	0.	
TWC	4.72E-04		7.41E-03		4.27E-03	
MED D	18		129		217	

AFWL CIRRHUS STUDY 9Y AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS: 17:22:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: SMALL SNOW

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (49)
2	2.26E+06	26	1.59E+05	3.46E+03	387.2
3	1.04E+07	49	9.62E+05	0.	ALT (KM)
5	1.92E+07	72	1.96E+04	0.	7.412
7	2.88E+07	95	2.34E+04	0.	TEMP (C)
9	2.83E+07	118	3.66E+04	0.	-26.4
11	2.15E+07	141	3.30E+04	0.	FROSTPOINT
12	1.24E+07	164	2.69E+04	0.	2813
14	1.69E+07	187	2.14E+04	0.	-26.6
16	1.24E+07	210	5.03E+04	0.	TAS (M/S)
18	6.22E+06	233	3.60E+04	0.	3503
19	5.37E+06	256	3.17E+04	0.	3848
21	4.24E+06	279	1.43E+04	0.	4193
23	2.82E+06	302	5.95E+03	0.	4538
25	3.68E+06	325	6.32E+03	0.	4883
27	2.26E+06	348	6.17E+03	0.	5228
IWC	4.30E-04	18	6.56E-03	3.43E-03	TOTALS
MED D			127	217	9.99E-03
					146

AFWL CIRRHUS STUDY 9Y AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS: 17:23:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: SMALL SNOW

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (49)
2	1.74E+06	26	3.60E+05	2.01E+03	387.7
3	8.99E+06	49	2.20E+06	9.97E+00	ALT (KM)
5	1.86E+07	72	2.62E+04	0.	7.402
7	3.74E+07	95	4.07E+04	0.	TEMP (C)
9	4.70E+07	118	5.87E+04	0.	-26.2
11	3.37E+07	141	4.48E+04	0.	FROSTPOINT
12	2.26E+07	164	6.38E+04	0.	2813
14	2.61E+07	187	4.00E+04	0.	-26.1
16	2.21E+07	210	1.20E+05	0.	TAS (M/S)
18	1.02E+07	233	6.94E+04	0.	3503
19	9.00E+06	256	5.09E+04	0.	3848
21	1.02E+07	279	3.40E+04	0.	4193
23	8.14E+06	302	3.07E+04	0.	4538
25	8.13E+06	325	2.78E+04	0.	4883
27	6.38E+06	348	1.81E+04	0.	5228
IWC	8.63E-04	20	1.48E-02	1.72E-03	TOTALS
MED D			130	218	1.65E-02
					135

INTERVAL STARTS: 17:22:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: SMALL SNOW

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (49)
2	1.71E+06	26	3.22E+05	4.42E+02	387.4
3	1.03E+07	49	9.40E+05	4.93E-01	ALT (KM)
5	1.34E+07	72	1.19E+04	0.	7.408
7	2.69E+07	95	3.08E+04	0.	TEMP (C)
9	2.83E+07	118	6.26E+04	0.	-25.3
11	2.37E+07	141	5.83E+04	0.	FROSTPOINT
12	1.43E+07	164	3.10E+04	0.	2813
14	1.77E+07	187	1.86E+04	0.	-25.3
16	1.06E+07	210	5.35E+04	0.	TAS (M/S)
18	6.85E+06	233	2.64E+04	0.	3848
19	6.57E+06	256	1.80E+04	0.	4193
21	4.29E+06	279	6.67E+03	0.	118.6
23	6.85E+06	302	7.19E+03	0.	4538
25	5.45E+06	325	7.76E+03	0.	4883
27	3.71E+06	348	4.85E+03	0.	5228
IWC	5.23E-04	20	5.81E-03	2.91E-04	TOTALS
MED D			119	217	6.10E-03
					121

INTERVAL STARTS: 17:24:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: SMALL SNOW

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (49)
2	3.55E+05	26	1.50E+05	7.05E+03	388.0
3	1.42E+07	49	9.69E+05	3.06E+02	ALT (KM)
5	2.49E+07	72	1.86E+04	7.21E+00	7.397
7	4.58E+07	95	3.32E+04	6.33E-01	TEMP (C)
9	5.38E+07	118	4.32E+04	0.	-25.2
11	4.43E+07	141	1.95E+04	0.	FROSTPOINT
12	3.58E+07	164	8.77E+03	0.	2813
14	3.37E+07	189	5.42E+03	0.	-25.5
16	2.78E+07	209	1.37E+04	0.	TAS (M/S)
18	1.09E+07	230	1.49E+04	0.	3454
19	1.06E+07	250	3.04E+04	0.	3760
21	9.17E+06	271	1.30E+04	0.	4065
23	8.28E+06	291	2.25E+04	0.	4370
25	8.87E+06	311	3.49E+04	0.	4676
27	7.09E+06	311	3.07E+04	0.	TOTALS
IWC	9.90E-04	19	3.50E-03	7.59E-03	1.11E-02
MED D			121	204	175

AFWL CIRRHUS STUDY BY AFGL

FLIGHT E70-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL START:1712430*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: GULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MM)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MM)
2	4.13E+06	26	2.63E+05	5.32E+03	388.0	2	3.25E+06	26	2.25E+05	3.90E+03	388.2
3	1.53E+07	47	4.44E+05	3.51E+02	ALT (KM)	3	1.77E+07	47	4.35E+05	1.93E+02	ALT (KM)
5	2.30E+07	67	1.85E+04	1.38E+01	7.396	5	3.34E+07	67	2.32E+04	1.011	7.393
7	4.60E+07	87	4.14E+04	0.	TEMP (C)	7	4.61E+07	87	1.38E+04	1316	0.
9	5.37E+07	108	4.32E+04	1622	-26.2	9	4.13E+07	108	1.38E+04	1622	0.
11	4.31E+07	128	1.25E+04	1927	0.	11	2.89E+07	128	1.39E+04	1927	0.
12	3.04E+07	148	6.75E+03	2233	0.	12	1.95E+07	148	1.09E+04	2233	0.
14	2.33E+07	169	3.61E+03	2538	0.	14	2.30E+07	169	2.71E+03	2538	0.
15	2.24E+07	189	1.17E+04	2843	0.	15	1.89E+07	189	5.85E+03	2843	0.
18	1.24E+07	209	3.19E+03	3149	-25.6	18	1.18E+07	209	1.06E+03	3149	0.
19	1.15E+07	230	2.34E+03	3454	0.	19	7.38E+06	230	5.85E+03	3454	0.
21	7.08E+06	250	6.50E+03	3760	11.8	21	7.38E+06	250	5.20E+03	3760	0.
23	9.45E+06	271	1.23E+04	4065	0.	23	3.84E+06	271	1.02E+04	4065	0.
25	5.32E+06	291	2.34E+04	4370	0.	25	4.72E+06	291	2.00E+04	4370	0.
27	7.38E+06	311	1.90E+04	4676	0.	27	5.02E+06	311	1.60E+04	4676	0.
IMC MED 0	8.87E-04	19	1.93E-03	212	TOTALS	IMC MED 0	6.74E-04	18	1.61E-03	206	TOTALS
			124	8.33E-03	190				124	5.93E-03	192

INTERVAL START:17125100*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: GULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MM)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MM)
2	5.60E+06	26	1.13E+05	4.25E+03	387.9	2	4.14E+06	26	2.26E+05	6.52E+03	388.1
3	1.86E+07	47	3.55E+05	2.49E+02	ALT (KM)	3	1.77E+07	47	5.94E+05	4.82E+02	ALT (KM)
5	3.36E+07	67	0.	6.59E+00	7.396	5	4.20E+07	67	2.32E+04	1.011	7.394
7	4.92E+07	87	8.27E+03	0.	TEMP (C)	7	6.68E+07	87	2.21E+04	1316	1.26E+00
9	2.96E+07	108	3.75E+04	1622	-26.3	9	5.71E+07	108	4.14E+04	1622	0.
11	2.68E+07	128	8.32E+03	1927	0.	11	4.17E+07	128	1.39E+04	1927	0.
12	1.92E+07	148	7.64E+03	2233	0.	12	3.40E+07	148	4.39E+03	2233	0.
14	1.42E+07	169	3.89E+03	2538	0.	14	2.75E+07	169	4.52E+03	2538	0.
16	8.25E+06	189	2.12E+03	2843	-25.4	16	2.75E+07	189	5.85E+03	2843	0.
18	8.25E+06	209	2.12E+03	3149	0.	18	1.54E+07	209	6.40E+03	3149	0.
19	8.25E+06	230	4.66E+03	3454	0.	19	1.09E+07	230	1.41E+04	3454	0.
21	5.60E+06	250	0.	3760	115.0	21	1.15E+07	250	1.43E+04	3760	0.
23	3.83E+06	271	9.95E+03	4065	0.	23	8.87E+06	271	1.96E+04	4065	0.
25	6.48E+06	291	1.99E+04	4370	0.	25	7.69E+06	291	2.70E+04	4370	0.
27	3.53E+06	311	1.61E+04	4676	0.	27	6.21E+06	311	2.21E+04	4676	0.
IMC MED 0	5.86E-04	19	1.45E-03	209	TOTALS	IMC MED 0	1.00E-03	19	2.48E-03	215	TOTALS
			126	4.90E-03	189				122	1.07E-02	193

AFML CIRQUE STUDY BY AFGL

FLIGHT E70-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS: 1726130*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MM)
2	6.00E+06	26	1.13E+05	437	3.98E+03	388.1
3	2.10E+07	47	3.46E+05	706	5.87E+02	ALT (KM)
5	4.14E+07	67	4.64E+05	1011	1.50E+01	7.395
7	5.17E+07	87	1.93E+04	1316	3.16E+00	TEMP (C)
9	4.25E+07	108	3.01E+04	1622	0.	-26.1
11	3.49E+07	128	1.53E+04	1927	0.	FROSTPOINT
12	2.54E+07	148	8.76E+03	2233	0.	-26.1
14	2.13E+07	169	9.03E+03	2538	0.	ALT (KM)
16	1.95E+07	189	3.90E+03	2843	0.	7.395
18	1.82E+07	209	3.19E+03	3149	0.	TEMP (C)
19	9.16E+06	230	4.68E+03	3454	0.	-26.1
21	6.50E+06	250	6.49E+03	3760	0.	FROSTPOINT
23	7.09E+06	271	8.73E+03	4065	0.	-26.1
25	5.91E+06	291	1.17E+04	4370	0.	ALT (KM)
27	3.25E+06	311	1.01E+04	4676	0.	7.395
IMC	7.24E-04	19	1.25E-03	117	6.34E-03	235
MED D						

TOTALS
7.59E-03
216

AFML CIRQUE STUDY BY AFGL

FLIGHT E70-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS: 1727430*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MM)
2	8.55E+06	26	3.00E+05	437	3.90E+03	387.8
3	3.21E+07	47	3.35E+05	706	7.41E+02	ALT (KM)
5	6.28E+07	67	2.31E+04	1011	4.14E+01	7.401
7	5.90E+07	87	1.65E+04	1316	2.52E+00	TEMP (C)
9	3.54E+07	108	3.75E+04	1622	0.	-25.0
11	3.09E+07	128	1.25E+04	1927	7.05E-01	FROSTPOINT
12	2.21E+07	148	9.83E+03	2233	7.49E-01	-25.4
14	2.09E+07	169	5.40E+03	2538	0.	ALT (KM)
16	1.66E+07	189	2.92E+03	2843	0.	7.401
18	1.06E+07	209	7.43E+03	3149	0.	TEMP (C)
19	7.07E+06	230	1.17E+03	3454	0.	-25.4
21	6.49E+06	250	3.89E+03	3760	0.	FROSTPOINT
23	5.89E+06	271	6.12E+03	4065	0.	-25.4
25	3.83E+06	291	9.63E+03	4370	0.	ALT (KM)
27	2.95E+06	311	8.49E+03	4676	0.	7.401
IMC	5.28E-04	19	1.09E-03	114	7.67E-03	261
MED D						

TOTALS
8.76E-03
241

INTERVAL STARTS: 1727430*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MM)
2	7.97E+06	26	1.87E+05	437	2.10E+03	388.0
3	2.86E+07	47	2.27E+05	706	8.86E+02	ALT (KM)
5	6.13E+07	67	1.36E+04	1011	3.60E+01	7.397
7	6.49E+07	87	8.29E+03	1316	1.89E+00	TEMP (C)
9	4.28E+07	108	3.00E+04	1622	0.	-26.0
11	2.86E+07	128	8.32E+03	1927	0.	FROSTPOINT
12	2.65E+07	148	8.75E+03	2233	0.	-26.4
14	2.77E+07	169	4.50E+03	2538	0.	ALT (KM)
16	1.92E+07	189	3.89E+03	2843	0.	7.397
18	1.36E+07	209	4.24E+03	3149	0.	TEMP (C)
19	5.90E+06	230	1.17E+03	3454	0.	-26.0
21	4.14E+06	250	1.29E+03	3760	0.	FROSTPOINT
23	7.09E+06	271	2.09E+03	4065	0.	-26.4
25	5.61E+06	291	3.36E+03	4370	0.	ALT (KM)
27	2.36E+06	311	3.14E+03	4676	0.	7.397
IMC	6.87E-04	17	5.69E-04	81	6.55E-03	289
MED D						

TOTALS
7.12E-03
288

INTERVAL STARTS: 1728400*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MM)
2	6.79E+06	26	2.62E+05	437	4.01E+03	387.8
3	3.10E+07	47	3.06E+05	706	1.22E+03	ALT (KM)
5	6.55E+07	67	2.32E+04	1011	8.34E+01	7.401
7	6.76E+07	87	2.76E+04	1316	1.00E+01	TEMP (C)
9	5.78E+07	108	3.19E+04	1622	6.65E-01	-25.9
11	3.78E+07	128	1.81E+04	1927	0.	FROSTPOINT
12	3.07E+07	148	1.09E+04	2233	0.	-26.3
14	3.25E+07	169	2.70E+03	2538	0.	ALT (KM)
16	2.54E+07	189	9.72E+03	2843	0.	7.401
18	1.42E+07	209	2.12E+03	3149	0.	TEMP (C)
19	1.06E+07	230	4.58E+03	3454	0.	-25.9
21	6.20E+06	250	2.59E+03	3760	0.	FROSTPOINT
23	1.06E+07	271	4.45E+03	4065	0.	-26.3
25	9.14E+06	291	7.64E+03	4370	0.	ALT (KM)
27	5.02E+06	311	6.98E+03	4676	0.	7.401
IMC	9.61E-04	19	9.94E-04	101	1.07E-02	287
MED D						

TOTALS
1.17E-02
275

AFWL CIRRUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL START: 17129:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M³-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB) 387.9
2	9.41E+06	26	7.48E+04	437	2.59E+03	
3	5.62E+07	47	3.05E+05	706	1.90E+02	
5	6.79E+07	67	0.	1011	5.98E+00	7.399
7	3.29E+07	87	1.10E+04	1316	0.	
9	3.50E+07	108	2.43E+04	1822	0.	TEMP (C)
11	2.69E+07	128	4.16E+03	1927	0.	-26.0
12	1.79E+07	148	4.36E+03	2233	0.	
14	1.97E+07	169	2.70E+03	2538	0.	FROSTPOINT
16	1.44E+07	189	2.91E+03	2843	0.	-26.1
18	5.30E+06	209	8.66E+03	3149	0.	
19	6.17E+06	230	6.98E+03	3454	0.	TAS (M/S)
21	4.41E+06	250	1.03E+04	3760	0.	115.3
23	3.82E+06	271	1.05E+04	4065	0.	
25	6.76E+06	291	1.07E+04	4370	0.	
27	2.05E+06	311	8.62E+03	4676	0.	
						TOTALS
	5.48E-04		1.22E-03		3.20E-03	4.41E-03
	19		116		214	196

INTERVAL STARTS*17:29:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/
TYPE: GULL-ROSE

INTERVAL START: 17:30:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M*3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (49)
2	2.09E+07	27	7.50E+04	437	3.52E+03	397.9
3	5.74E+07	46	5.12E+05	706	1.15E+02	ALT (KM)
5	5.74E+07	67	9.25E+03	1031	4.79E+00	7.398
7	4.56E+07	87	1.10E+04	1316	0.	TEMP (C)
9	3.25E+07	108	1.50E+04	1632	0.	-25.9
11	3.03E+07	148	9.71E+03	1927	0.	FROSTPOINT
12	1.94E+07	178	2.19E+03	2253	0.	-25.3
14	1.38E+07	199	3.60E+03	2538	0.	TAS (M/S)
16	1.24E+07	189	7.77E+03	2943	0.	115.1
18	7.36E+06	209	1.48E+04	3149	0.	TOTALS
19	5.59E+06	230	1.40E+04	3454	0.	5.79E-03
21	4.71E+06	250	1.04E+04	3760	0.	201
23	3.53E+06	271	1.56E+04	4065	0.	167
25	5.00E+06	291	2.36E+04	4370	0.	
27	4.12E+06	311	1.62E+04	4676	0.	
IMC	5.43E-04	2.	0.9E-03	3.70E-03		
WED	19	122		201		

AFML CIRRUS STUDY BY AFGL

FLIGHT 878-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS:17:30:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	1.30E+07	26	7.49E+04	5.65E+03	387.3	2	2.47E+07	26	1.50E+05	1.65E+03	387.8
3	5.92E+07	47	5.52E+05	3.18E+02		3	7.20E+07	47	1.08E+05	706	
5	7.63E+07	67	0.	2.34E+01	7.399	5	8.11E+07	67	2.31E+04	1011	ALT (KM)
7	5.18E+07	87	1.65E+04	3.78E+00		7	6.36E+07	87	1.10E+04	1316	7.401
9	4.18E+07	108	1.69E+04	0.		9	4.20E+07	108	9.35E+03	1622	TEMP (C)
11	3.45E+07	128	6.94E+03	0.	-25.0	11	3.23E+07	128	1.11E+04	1927	-25.9
12	1.91E+07	148	5.46E+03	0.		12	2.18E+07	148	4.36E+03	2233	FROSTPOINT
14	2.15E+07	169	6.30E+03	0.	-26.0	14	2.35E+07	169	2.70E+03	2538	-26.0
16	1.47E+07	189	1.65E+04	0.		16	1.79E+07	189	1.94E+03	2843	0.
18	7.95E+06	209	2.76E+04	0.		18	7.06E+06	209	0.	3149	0.
19	1.03E+07	230	1.52E+04	0.		19	4.71E+06	230	1.16E+03	3454	0.
21	6.19E+06	250	1.82E+04	0.	115.1	21	5.60E+06	250	0.	3760	0.
23	4.71E+06	271	2.22E+04	0.		23	3.82E+06	271	1.17E+03	4065	0.
25	6.18E+06	291	2.71E+04	0.		25	3.53E+06	291	2.33E+03	4370	0.
27	1.77E+06	311	2.18E+04	0.		27	4.12E+06	311	2.22E+03	4676	0.
IMC	6.32E-04		2.71E-03	6.77E-03	TOTALS	IMC	5.95E-04		3.37E-04	7.46E-03	TOTALS
MED D	19		119	212	9.48E-03	MED D	17		76	318	7.80E-03
					133						312

AFML CIRRUS STUDY BY AFGL

FLIGHT 878-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS:17:31:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	1.30E+07	26	7.49E+04	5.65E+03	387.3	2	2.47E+07	26	1.50E+05	1.65E+03	387.8
3	5.92E+07	47	5.52E+05	3.18E+02		3	7.20E+07	47	1.08E+05	706	
5	7.63E+07	67	0.	2.34E+01	7.399	5	8.11E+07	67	2.31E+04	1011	ALT (KM)
7	5.18E+07	87	1.65E+04	3.78E+00		7	6.36E+07	87	1.10E+04	1316	7.401
9	4.18E+07	108	1.69E+04	0.		9	4.20E+07	108	9.35E+03	1622	TEMP (C)
11	3.45E+07	128	6.94E+03	0.	-25.0	11	3.23E+07	128	1.11E+04	1927	-25.9
12	1.91E+07	148	5.46E+03	0.		12	2.18E+07	148	4.36E+03	2233	FROSTPOINT
14	2.15E+07	169	6.30E+03	0.	-26.0	14	2.35E+07	169	2.70E+03	2538	-26.0
16	1.47E+07	189	1.65E+04	0.		16	1.79E+07	189	1.94E+03	2843	0.
18	7.95E+06	209	2.76E+04	0.		18	7.06E+06	209	0.	3149	0.
19	1.03E+07	230	1.52E+04	0.		19	4.71E+06	230	1.16E+03	3454	0.
21	6.19E+06	250	1.82E+04	0.	115.1	21	5.60E+06	250	0.	3760	0.
23	4.71E+06	271	2.22E+04	0.		23	3.82E+06	271	1.17E+03	4065	0.
25	6.18E+06	291	2.71E+04	0.		25	3.53E+06	291	2.33E+03	4370	0.
27	1.77E+06	311	2.18E+04	0.		27	4.12E+06	311	2.22E+03	4676	0.
IMC	6.32E-04		2.71E-03	6.77E-03	TOTALS	IMC	5.95E-04		3.37E-04	7.46E-03	TOTALS
MED D	19		119	212	9.48E-03	MED D	17		76	318	7.80E-03
					133						312

INTERVAL STARTS:17:31:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	1.97E+07	26	1.50E+05	2.10E+03	387.8	2	3.24E+07	26	3.74E+04	1.56E+03	387.3
3	8.52E+07	47	1.18E+05	6.40E+02		3	8.62E+07	47	9.95E+04	3.65E+02	
5	8.38E+07	67	0.	4.72E+01	7.400	5	9.03E+07	67	4.62E+03	2.33E+01	7.401
7	5.97E+07	87	8.25E+03	1.26E+00		7	5.77E+07	87	1.55E+04	6.30E-01	
9	3.75E+07	108	5.80E+03	1.33E+00		9	3.65E+07	108	9.35E+03	1622	TEMP (C)
11	2.65E+07	128	9.69E+03	0.	-25.0	11	2.85E+07	128	1.38E+03	1927	-25.9
12	2.44E+07	148	5.44E+03	0.		12	1.88E+07	148	5.45E+03	2233	FROSTPOINT
14	1.70E+07	169	2.70E+03	0.	-25.3	14	1.62E+07	169	9.70E+02	2538	-25.8
16	1.79E+07	189	0.	0.		16	1.24E+07	189	1.06E+03	2843	0.
18	7.64E+06	209	3.17E+03	0.		18	7.65E+06	209	0.	3149	0.
19	7.94E+06	230	3.50E+03	0.		19	4.41E+06	230	0.	3454	0.
21	5.29E+06	250	1.29E+03	0.	115.3	21	3.53E+06	250	0.	3760	0.
23	4.41E+06	271	2.28E+03	0.		23	3.82E+06	271	1.72E+03	4065	0.
25	2.64E+06	291	4.02E+03	0.		25	1.76E+06	291	3.44E+03	4370	0.
27	3.53E+06	311	3.67E+03	0.		27	3.82E+06	311	3.09E+03	4676	0.
IMC	5.63E-04		4.65E-04	5.60E-03	TOTALS	IMC	4.90E-04		3.21E-04	3.40E-03	TOTALS
MED D	18		112	286	6.06E-03	MED D	17		123	270	3.72E-03
					276						258

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS: 17:33:00
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	4.77E+07	26	0.	437	1.67E+03	387.8
3	7.89E+07	47	7.88E+04	706	4.41E+02	ALT (KM)
5	5.39E+07	67	0.	1011	4.91E+01	7.400
7	3.89E+07	87	1.65E+04	1316	5.04E+00	TEMP (C)
9	2.41E+07	108	5.62E+03	1622	1.33E+00	-25.3
11	2.00E+07	128	4.16E+03	1927	0.	FROSTPOINT
12	1.18E+07	148	1.09E+03	2233	0.	-25.9
14	1.03E+07	169	1.80E+03	2538	0.	FROSTPOINT
16	1.00E+07	189	1.95E+03	2843	0.	-25.9
18	5.59E+06	209	2.12E+03	3149	0.	TAS M/S
19	4.42E+06	230	2.38E+03	3454	0.	115.1
21	2.06E+06	250	1.29E+03	3760	0.	TOTALS
23	2.94E+06	271	2.11E+03	4065	0.	4.79E-03
25	2.94E+06	291	3.44E+03	4370	0.	4.42E-03
27	8.83E+05	311	3.11E+03	4676	0.	292
IMC	3.45E-04	17	3.64E-04	118		281
MED D						

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS: 17:33:00
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	2.65E+07	26	2.62E+05	437	5.99E+03	387.8
3	9.42E+07	47	4.63E+05	706	9.51E+02	ALT (KM)
5	8.44E+07	67	0.	1011	1.27E+02	7.400
7	6.62E+07	87	1.10E+04	1316	1.95E+01	TEMP (C)
9	5.18E+07	108	1.87E+04	1622	9.31E+00	-26.0
11	3.88E+07	128	1.86E+04	1927	1.41E+00	FROSTPOINT
12	2.77E+07	148	7.63E+03	2233	0.	-25.6
14	2.29E+07	169	3.60E+03	2538	0.	TAS M/S
16	2.24E+07	189	4.86E+03	2843	0.	115.2
18	1.18E+07	209	1.36E+04	3149	0.	TOTALS
19	1.03E+07	230	1.98E+04	3454	0.	1.27E-02
21	8.53E+06	250	1.68E+04	3760	0.	278
23	6.77E+06	271	1.56E+04	4065	0.	
25	7.06E+06	291	1.63E+04	4370	0.	
27	3.82E+05	311	1.42E+04	4676	0.	
IMC	8.25E-04	19	2.01E-03	115		
MED D						

INTERVAL STARTS: 17:33:00
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	4.95E+07	26	0.	437	3.36E+03	387.8
3	8.70E+07	47	2.17E+05	706	3.24E+02	ALT (KM)
5	6.16E+07	67	0.	1011	4.56E+01	7.400
7	4.63E+07	87	2.76E+03	1316	1.07E+01	TEMP (C)
9	2.98E+07	108	1.69E+04	1622	0.	-25.9
11	2.62E+07	128	1.39E+03	1927	7.05E-01	FROSTPOINT
12	1.47E+07	148	0.	2233	0.	-25.6
14	1.80E+07	169	1.80E+03	2538	0.	TAS M/S
16	1.03E+07	189	1.94E+03	2843	0.	114.9
18	7.67E+06	209	5.30E+03	3149	0.	TOTALS
19	5.04E+06	230	8.18E+03	3454	0.	6.39E-03
21	2.65E+06	250	2.59E+03	3760	0.	5.44E-03
23	2.65E+06	271	5.58E+03	4065	0.	237
25	3.24E+06	291	1.20E+04	4370	0.	
27	3.83E+06	311	1.01E+04	4676	0.	
IMC	4.68E-04	18	9.59E-04	125		
MED D						

INTERVAL STARTS: 17:34:00
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	2.20E+07	26	2.98E+05	437	7.93E+03	387.8
3	9.33E+07	47	6.28E+05	706	9.91E+02	ALT (KM)
5	9.85E+07	67	2.76E+04	1011	9.36E+01	7.400
7	7.10E+07	87	1.10E+04	1316	1.07E+01	TEMP (C)
9	5.78E+07	108	3.17E+04	1622	3.31E+00	-25.9
11	4.46E+07	128	2.35E+04	1927	0.	FROSTPOINT
12	3.40E+07	148	7.61E+03	2233	1.49E+00	-25.9
14	2.79E+07	169	2.69E+03	2538	0.	TAS M/S
16	2.05E+07	189	1.36E+04	2843	0.	115.5
18	1.67E+07	209	1.16E+04	3149	0.	TOTALS
19	1.14E+07	230	1.16E+04	3454	0.	1.31E-02
21	8.21E+06	250	1.16E+04	3760	0.	238
23	7.63E+06	271	1.74E+04	4065	0.	
25	8.21E+06	291	2.58E+04	4370	0.	
27	7.03E+06	311	2.20E+04	4676	0.	
IMC	9.80E-04	19	2.46E-03	121		
MED D						

AFML CIRRUS STUDY BY AFGL

FLIGHT 678-09 ON 21 MAR 76 30 SECOND AVERAGING
INTERVAL STARTS:17:34:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: GULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	7.73E+07	26	1.94E+05	437	6.53E+03	386.8	2	6.89E+07	26	7.33E+05	437	1.20E+04	378.4
3	1.35E+08	47	4.65E+05	706	1.23E+03		3	1.72E+08	47	2.32E+06	706	5.16E+02	
5	1.12E+08	67	1.81E+04	1011	1.17E+02	7.418	5	1.39E+08	67	2.71E+04	1011	2.35E+01	7.572
7	9.53E+07	87	1.08E+04	1316	8.71E+00		7	1.09E+08	87	5.12E+04	1316	6.17E-01	
9	6.61E+07	108	2.95E+04	1622	1.97E+00		9	8.01E+07	108	4.95E+04	1622	0.	TEMP (C)
11	4.89E+07	128	1.36E+04	1927	7.02E-01	-26.1	11	7.03E+07	128	2.17E+04	1927	0.	-27.3
12	3.03E+07	148	9.66E+03	2233	0.		12	4.70E+07	148	1.07E+04	2233	0.	FROSTPOINT
14	3.10E+07	169	8.95E+02	2538	0.		14	3.86E+07	169	1.76E+04	2538	0.	-26.8
15	3.12E+07	189	4.77E+03	2843	0.	-25.9	15	2.07E+07	189	6.09E+04	2843	0.	
18	1.59E+07	209	6.27E+03	3149	0.		18	2.07E+07	209	9.75E+04	3149	0.	TAS (M/S)
19	1.19E+07	230	9.23E+03	3454	0.	117.1	19	1.82E+07	230	9.47E+04	3454	0.	117.6
21	7.23E+06	250	5.38E+03	3760	0.		21	1.35E+07	250	6.09E+04	3760	0.	
23	1.07E+07	271	1.02E+04	4065	0.		23	1.50E+07	271	6.69E+04	4065	0.	
25	8.41E+06	291	1.62E+04	4370	0.		25	1.47E+07	291	7.35E+04	4370	0.	
27	4.05E+06	311	1.43E+04	4676	0.		27	1.04E+07	311	5.76E+04	4676	0.	
IWC	1.03E-03		1.50E-03		1.34E-02	TOTALS	IWC	1.57E-03		8.88E-03		1.37E-02	TOTALS
MED D	18		120		268	1.50E-02	MED D	19		113		204	2.26E-02
						250							163

AFML CIRRUS STUDY BY AFGL

FLIGHT 678-09 ON 21 MAR 76 30 SECOND AVERAGING
INTERVAL STARTS:17:35:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: GULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	1.03E+08	26	2.55E+05	437	9.56E+03	383.2	2	4.41E+07	26	7.33E+05	437	2.15E+04	373.8
3	1.45E+08	47	8.92E+05	706	7.89E+02		3	1.91E+08	47	2.20E+06	706	1.22E+03	
5	1.21E+08	67	2.25E+04	1011	5.13E+01	7.484	5	1.90E+08	67	3.17E+04	1011	6.50E+01	7.657
7	9.78E+07	87	4.29E+04	1316	4.90E+00		7	1.55E+08	87	7.01E+04	1316	2.47E+00	
9	7.40E+07	108	6.56E+04	1622	0.		9	1.03E+08	108	1.06E+05	1622	0.	TEMP (C)
11	5.02E+07	128	1.08E+04	1927	6.85E-01	-25.6	11	9.33E+07	128	3.53E+04	1927	6.89E-01	-27.3
12	3.47E+07	148	9.57E+03	2233	7.28E-01		12	6.68E+07	148	3.10E+04	2233	0.	FROSTPOINT
14	3.61E+07	169	6.13E+03	2538	0.		14	5.96E+07	169	1.23E+04	2538	0.	-27.2
16	3.76E+07	189	1.76E+04	2843	0.	-26.1	16	5.65E+07	189	3.52E+04	2843	0.	
18	2.18E+07	209	2.61E+04	3149	0.		18	2.94E+07	209	3.84E+04	3149	0.	TAS (M/S)
19	1.00E+07	230	2.61E+04	3454	0.	119.2	19	2.10E+07	230	5.82E+04	3454	0.	117.6
21	1.12E+07	250	2.52E+04	3760	0.		21	1.90E+07	250	5.58E+04	3760	0.	
23	1.32E+07	271	3.06E+04	4065	0.		23	1.99E+07	271	7.56E+04	4065	0.	
25	6.60E+06	291	3.72E+04	4370	0.		25	1.70E+07	291	1.02E+05	4370	0.	
27	9.74E+06	311	3.08E+04	4676	0.		27	1.24E+07	311	8.24E+04	4676	0.	
IWC	1.29E-03		3.81E-03		1.29E-02	TOTALS	IWC	2.06E-03		9.42E-03		2.51E-02	TOTALS
MED D	19		119		221	1.67E-02	MED D	19		121		210	3.46E-02
						197							184

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL START:17136130*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: RULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (49)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (49)
2	4.63E+07	26	6.98E+05	437	1.64E+04	359.0	2	5.46E+07	26	6.68E+05	437	1.92E+04	350.3
3	1.97E+08	47	1.33E+06	706	2.71E+03		3	2.60E+08	47	1.74E+06	706	2.05E+03	
5	3.32E+08	67	4.09E+04	1011	2.10E+02	ALT (KM)	5	2.07E+08	67	5.95E+04	1011	1.41E+02	ALT (KM)
7	1.75E+08	87	4.87E+04	1316	1.42E+01	7.743	7	1.75E+08	87	6.27E+04	1316	8.73E+00	7.913
9	1.31E+08	108	1.18E+05	1622	6.53E-01	TEMP (C)	9	1.29E+08	108	9.09E+04	1622	5.56E-01	TEMP (C)
11	9.91E+07	128	4.36E+04	1927	2.08E+00	-28.5	11	9.57E+07	128	3.98E+04	1927	0.	-29.6
12	6.31E+07	148	2.79E+04	2233	2.21E+00		12	6.54E+07	148	3.03E+04	2233	0.	
14	7.17E+07	169	1.50E+04	2538	0.	FROSTPOINT	14	6.74E+07	169	1.78E+04	2538	0.	FROSTPOINT
16	6.08E+07	189	2.29E+04	2843	0.	-27.4	16	6.42E+07	189	1.93E+04	2843	0.	-28.8
18	3.79E+07	209	1.87E+04	3149	0.		18	3.05E+07	209	2.31E+04	3149	0.	
19	2.68E+07	230	1.94E+04	3454	0.	TAS (M/S)	19	2.19E+07	230	3.47E+04	3454	0.	TAS (M/S)
21	2.52E+07	250	2.03E+04	3760	0.	117.1	21	2.01E+07	250	3.59E+04	3760	0.	116.1
23	2.49E+07	271	2.98E+04	4065	0.		23	2.39E+07	271	4.82E+04	4065	0.	
25	2.31E+07	291	4.38E+04	4370	0.		25	2.27E+07	291	6.48E+04	4370	0.	
27	1.91E+07	311	3.82E+04	4676	0.		27	1.20E+07	311	5.47E+04	4676	0.	
IWC MED D	2.57E-03 20		4.62E-03 118			TOTALS	IWC MED D	2.29E-03 19		6.41E-03 120		2.84E-02 225	TOTALS
						3.54E-02 235						3.48E-02 208	

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL START:17137130*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: RULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (49)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (49)
2	1.02E+08	26	3.33E+05	437	7.23E+03	354.5	2	8.35E+07	26	6.30E+05	437	1.45E+04	356.7
3	1.59E+08	47	6.22E+05	706	1.91E+03		3	1.77E+08	47	1.07E+06	706	1.40E+03	
5	1.35E+08	67	1.83E+04	1011	1.12E+02	ALT (KM)	5	1.65E+08	67	2.29E+04	1011	1.04E+02	ALT (KM)
7	1.09E+08	87	2.99E+04	1316	6.85E+00	7.933	7	1.17E+08	87	5.00E+04	1316	4.37E+00	7.983
9	7.99E+07	108	4.62E+04	1622	0.	TEMP (C)	9	9.54E+07	108	6.12E+04	1622	0.	TEMP (C)
11	6.42E+07	128	2.38E+04	1927	0.	-29.1	11	6.97E+07	128	2.38E+04	1927	6.98E-01	-30.2
12	4.33E+07	148	1.83E+04	2233	0.		12	4.96E+07	148	1.19E+04	2233	7.41E-01	
14	4.13E+07	169	8.00E+03	2538	0.	FROSTPOINT	14	4.96E+07	169	1.25E+04	2538	0.	FROSTPOINT
16	3.05E+07	189	1.25E+04	2843	0.	-29.2	16	4.87E+07	189	8.66E+03	2843	0.	-29.2
18	2.27E+07	209	8.37E+03	3149	0.		18	2.74E+07	209	1.57E+04	3149	0.	
19	1.71E+07	230	3.45E+03	3454	0.	TAS (M/S)	19	2.04E+07	230	1.85E+04	3454	0.	TAS (M/S)
21	1.88E+07	250	6.40E+03	3760	0.	115.6	21	9.84E+06	250	9.3E+04	3760	0.	115.1
23	1.19E+07	271	9.77E+03	4065	0.		23	1.34E+07	271	3.16E+04	4065	0.	
25	1.34E+07	291	1.49E+04	4370	0.		25	1.40E+07	291	5.19E+04	4370	0.	
27	9.59E+06	311	1.35E+04	4676	0.		27	1.14E+07	311	4.34E+04	4676	0.	
IWC MED D	1.49E-03 20		1.77E-03 112			TOTALS	IWC MED D	1.67E-03 18		4.48E-03 123		2.08E-02 226	TOTALS
						1.88E-02 263						2.53E-02 207	

AFWL CIRRHUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS: 17:30:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (M)
2	5.02E+07	26	9.98E+05	437	2.32E+04	353.3
3	2.08E+08	47	2.34E+06	706	1.78E+03	ALT (KM)
5	2.21E+08	67	8.21E+04	1011	1.31E+02	8.049
7	1.86E+08	87	7.88E+04	1316	1.37E+01	TEMP (C)
9	1.48E+08	108	1.37E+05	1622	6.57E-01	-30.7
11	1.07E+08	128	4.65E+04	1927	6.97E-01	FROSTPOINT
12	8.11E+07	148	2.48E+04	2233	7.41E-01	-23.6
14	8.54E+07	169	1.86E+04	2538	0.	TAS (M/S)
16	6.01E+07	189	1.53E+04	2843	0.	116.7
18	3.81E+07	209	4.71E+04	3149	0.	TOTALS
19	2.70E+07	230	8.05E+04	3454	0.	4.08E-02
21	2.15E+07	250	7.92E+04	3760	0.	3.07E-02
23	2.53E+07	271	8.63E+04	4065	0.	219
25	1.80E+07	291	9.39E+04	4370	0.	SIZE (MU)
27	1.68E+07	311	7.73E+04	4676	0.	SCATTER PROBE
IMC	2.52E-03		1.01E-02			SIZE (MU)
MED D	19		118			CLOUD PROBE

INTERVAL STARTS: 17:39:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (M)
2	4.41E+07	26	1.18E+06	437	2.46E+04	350.2
3	2.13E+08	47	3.39E+06	706	1.63E+03	ALT (KM)
5	2.18E+08	67	5.01E+04	1011	1.49E+02	9.110
7	1.96E+08	87	8.95E+04	1316	1.37E+01	TEMP (C)
9	1.41E+08	108	1.23E+05	1622	2.62E+00	-31.1
11	1.08E+08	128	5.05E+04	1927	2.08E+00	FROSTPOINT
12	7.51E+07	148	3.87E+04	2233	2.21E+00	-30.0
14	8.49E+07	169	2.84E+04	2538	0.	TAS (M/S)
15	5.86E+07	189	9.66E+04	2843	0.	116.3
18	4.06E+07	209	1.35E+05	3149	0.	TOTALS
19	2.70E+07	230	1.27E+05	3454	0.	4.54E-02
21	2.96E+07	250	9.57E+04	3760	0.	3.19E-02
23	2.49E+07	271	1.02E+05	4065	0.	217
25	2.35E+07	291	1.08E+05	4370	0.	SIZE (MU)
27	1.97E+07	311	8.81E+04	4676	0.	SCATTER PROBE
IMC	2.72E-03		1.34E-02			SIZE (MU)
MED D	20		113			CLOUD PROBE

AFWL CIRRHUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS: 17:39:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (M)
2	1.20E+08	26	7.73E+05	437	8.96E+03	347.6
3	1.56E+08	47	2.86E+06	706	1.66E+02	ALT (KM)
5	1.45E+08	67	1.36E+04	1011	6.47E+00	8.162
7	1.07E+08	87	3.51E+04	1316	0.	TEMP (C)
9	8.35E+07	108	4.96E+04	1622	0.	-31.5
11	7.43E+07	128	2.59E+04	1927	0.	FROSTPOINT
12	4.69E+07	148	3.76E+04	2233	0.	-30.5
14	4.83E+07	169	2.46E+04	2538	0.	TAS (M/S)
16	3.56E+07	189	9.45E+04	2843	0.	117.3
18	2.69E+07	209	1.40E+05	3149	0.	TOTALS
19	1.89E+07	230	1.33E+05	3454	0.	8.52E-03
21	1.62E+07	250	7.86E+04	3760	0.	197
23	1.65E+07	271	7.87E+04	4065	0.	SIZE (MU)
25	1.04E+07	291	7.86E+04	4370	0.	SCATTER PROBE
27	8.98E+06	311	5.81E+04	4676	0.	SIZE (MU)
IMC	1.57E-03		1.06E-02			CLOUD PROBE
MED D	19		109			PRECIP PROBE

INTERVAL STARTS: 17:42:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (M)
2	9.52E+07	26	7.28E+05	437	2.21E+04	345.2
3	1.92E+08	47	2.52E+06	706	1.43E+03	ALT (KM)
5	1.90E+08	67	2.70E+04	1011	1.22E+02	8.209
7	1.74E+08	87	5.90E+04	1316	1.04E+01	TEMP (C)
9	1.22E+08	108	9.47E+04	1622	6.48E-01	-31.9
11	8.91E+07	128	3.24E+04	1927	1.37E+00	FROSTPOINT
12	6.47E+07	148	2.65E+04	2233	7.27E-01	-31.0
14	6.56E+07	169	2.01E+04	2538	0.	TAS (M/S)
16	6.13E+07	189	5.57E+04	2843	0.	119.3
18	2.98E+07	209	6.70E+04	3149	0.	TOTALS
19	2.18E+07	230	8.96E+04	3454	0.	2.80E-02
21	2.09E+07	250	6.43E+04	3760	0.	215
23	1.89E+07	271	7.96E+04	4065	0.	SIZE (MU)
25	1.95E+07	291	9.86E+04	4370	0.	SCATTER PROBE
27	1.37E+07	311	8.01E+04	4676	0.	SIZE (MU)
IMC	2.18E-03		1.03E-02			CLOUD PROBE
MED D	19		110			PRECIP PROBE

AFML CIRRHUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL START: 17:40:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: RULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	1.06E+08	26	3.25E+05	437	1.31E+04	342.9
3	2.10E+08	47	2.08E+06	706	3.37E+02	
5	1.70E+08	67	3.12E+04	1011	1.10E+01	ALT (KM)
7	1.52E+08	87	6.64E+04	1316	0.	8.255
9	1.06E+08	108	5.41E+04	1622	0.	TEMP (C)
11	8.65E+07	128	2.95E+04	1927	0.	-32.4
12	5.72E+07	148	1.48E+04	2233	0.	
14	5.65E+07	169	1.65E+04	2538	0.	FROSTPOINT
16	4.61E+07	189	5.15E+04	2843	0.	-31.6
18	2.82E+07	209	6.34E+04	3149	0.	
19	2.67E+07	230	7.98E+04	3454	0.	TAS (M/S)
21	1.71E+07	250	7.50E+04	3760	0.	113.1
23	1.62E+07	271	8.51E+04	4065	0.	
25	1.51E+07	291	9.65E+04	4370	0.	
27	1.34E+07	311	7.31E+04	4676	0.	
TOTALS						
IMC	1.94E-03		9.75E-03		1.30E-02	2.27E-02
MED D	19		118		199	155

INTERVAL START: 17:41:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: RULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	1.49E+08	26	2.15E+05	437	1.18E+04	341.0
3	1.86E+08	47	1.33E+06	706	7.46E+02	
5	1.81E+08	67	2.65E+04	1011	4.88E+01	ALT (KM)
7	1.33E+08	87	2.64E+04	1316	6.04E+00	8.294
9	1.06E+08	108	6.63E+04	1622	6.38E-01	TEMP (C)
11	7.30E+07	128	1.88E+04	1927	6.75E-01	-32.7
12	5.69E+07	148	1.88E+04	2233	0.	
14	5.24E+07	169	7.75E+03	2538	0.	FROSTPOINT
16	4.34E+07	189	9.29E+03	2843	0.	-32.3
18	2.57E+07	209	2.03E+04	3149	0.	
19	2.17E+07	230	2.46E+04	3454	0.	TAS (M/S)
21	1.49E+07	250	2.85E+04	3760	0.	120.3
23	1.30E+07	271	3.98E+04	4065	0.	
25	1.35E+07	291	5.30E+04	4370	0.	
27	8.74E+06	311	4.30E+04	4676	0.	
TOTALS						
IMC	1.67E-03		4.65E-03		1.46E-02	1.94E-02
MED D	18		122		214	189

AFML CIRRHUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL START: 17:41:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: RULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	1.37E+08	26	2.13E+05	437	6.81E+03	339.2
3	1.90E+08	47	1.52E+06	706	1.56E+02	
5	1.64E+08	67	3.51E+04	1011	4.54E+00	ALT (KM)
7	1.36E+08	87	1.31E+04	1316	0.	6.329
9	9.99E+07	108	3.02E+04	1622	0.	TEMP (C)
11	6.91E+07	128	9.22E+03	1927	0.	-33.0
12	5.71E+07	148	1.66E+04	2233	0.	
14	4.73E+07	169	9.40E+03	2538	0.	FROSTPOINT
16	4.14E+07	189	4.34E+04	2843	0.	-32.7
18	2.63E+07	209	6.83E+04	3149	0.	
19	1.96E+07	230	7.30E+04	3454	0.	TAS (M/S)
21	1.43E+07	250	4.92E+04	3760	0.	121.1
23	1.51E+07	271	5.11E+04	4065	0.	
25	1.48E+07	291	5.30E+04	4370	0.	
27	1.29E+07	311	3.98E+04	4676	0.	
TOTALS						
IMC	1.74E-03		5.22E-03		6.61E-03	1.20E-02
MED D	19		114		198	144

INTERVAL START: 17:42:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: RULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	1.06E+08	26	9.07E+05	437	1.23E+04	339.0
3	2.12E+08	47	1.22E+06	706	3.25E+02	
5	2.10E+08	67	1.72E+04	1011	2.83E+01	ALT (KM)
7	1.81E+08	87	5.65E+04	1316	1.17E+00	6.354
9	1.25E+08	108	9.04E+04	1622	0.	TEMP (C)
11	9.80E+07	128	6.69E+04	1927	0.	-33.3
12	7.30E+07	148	7.21E+04	2233	0.	
14	7.60E+07	169	5.43E+04	2538	0.	FROSTPOINT
16	6.01E+07	189	1.07E+05	2843	0.	-32.9
18	3.39E+07	209	9.35E+04	3149	0.	
19	3.27E+07	230	9.35E+04	3454	0.	TAS (M/S)
21	2.07E+07	250	7.85E+04	3760	0.	122.6
23	2.14E+07	271	8.38E+04	4065	0.	
25	2.18E+07	291	8.95E+04	4370	0.	
27	1.51E+07	311	6.79E+04	4676	0.	
TOTALS						
IMC	2.43E-03		1.12E-02		1.25E-02	2.30E-02
MED D	19		111		201	147

AFML CIRRHUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS*174230*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: RULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MM)
2	8.96E+07	26	2.25E+06	437	8.68E+03	339.1
3	1.77E+08	47	4.04E+06	706	2.50E+02	ALT (KM)
5	2.16E+08	67	5.97E+04	1011	1.16E+01	8.351
7	1.78E+08	87	1.09E+05	1316	0.	TEMP (C)
9	1.27E+08	108	2.77E+05	1622	0.	-33.2
11	1.09E+08	128	1.65E+05	1927	0.	FROSTPOINT
12	6.31E+07	148	1.67E+05	2233	0.	-33.0
14	7.45E+07	169	8.48E+04	2538	0.	TAS (M/S)
16	5.85E+07	189	1.94E+05	2843	0.	124.5
18	3.13E+07	209	1.39E+05	3149	0.	TOTALS
19	2.39E+07	230	9.48E+04	3454	0.	2.11E-02
21	2.45E+07	250	6.70E+04	3760	0.	8.75E-03
23	2.47E+07	271	6.34E+04	4065	0.	200
25	2.29E+07	291	5.99E+04	4370	0.	20
27	1.63E+07	311	4.58E+04	4676	0.	92
IWC MED D	2.45E-03		1.23E-02			

AFML CIRRHUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS*174330*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: RULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MM)
2	1.06E+08	26	3.41E+05	437	1.39E+03	339.0
3	2.36E+08	47	7.83E+05	706	4.01E+01	ALT (KM)
5	1.88E+08	67	2.80E+04	1011	5.50E-01	8.353
7	1.48E+08	87	4.16E+04	1316	0.	TEMP (C)
9	9.64E+07	108	3.07E+04	1622	0.	-33.4
11	8.42E+07	128	3.12E+04	1927	0.	FROSTPOINT
12	6.21E+07	148	3.12E+04	2233	0.	-33.9
14	6.02E+07	169	2.08E+04	2538	0.	TAS (M/S)
16	5.50E+07	189	4.67E+04	2843	0.	124.5
18	3.11E+07	209	2.26E+04	3149	0.	TOTALS
19	2.37E+07	230	1.51E+04	3454	0.	1.36E-03
21	1.77E+07	250	1.20E+04	3760	0.	200
23	1.82E+07	271	1.06E+04	4065	0.	19
25	2.13E+07	291	9.44E+03	4370	0.	
27	1.17E+07	311	7.23E+03	4676	0.	
IWC MED D	2.07E-03		2.23E-03			

INTERVAL STARTS*174330*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: RULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MM)
2	1.20E+08	26	5.47E+05	437	1.27E+02	337.9
3	2.22E+08	47	5.90E+05	706	5.25E-01	ALT (KM)
5	1.93E+08	67	1.28E+04	1011	0.	8.355
7	1.44E+08	87	4.32E+04	1316	0.	TEMP (C)
9	1.06E+08	108	9.31E+04	1622	0.	-33.4
11	7.70E+07	128	4.09E+04	1927	0.	FROSTPOINT
12	6.15E+07	148	4.12E+04	2233	0.	-33.1
14	6.26E+07	169	1.41E+04	2538	0.	TAS (M/S)
16	5.81E+07	189	3.49E+04	2843	0.	124.6
18	3.35E+07	209	8.80E+03	3149	0.	TOTALS
19	2.56E+07	230	1.08E+04	3454	0.	9.47E-05
21	2.80E+07	250	1.19E+03	3760	0.	193
23	2.80E+07	271	1.30E+03	4065	0.	20
25	2.56E+07	291	1.41E+03	4370	0.	69
27	2.23E+07	311	1.01E+03	4676	0.	
IWC MED D	2.57E-03		1.45E-03			

INTERVAL STARTS*174400*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: RULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MM)
2	1.17E+08	26	2.43E+05	437	4.31E+03	339.1
3	2.42E+08	47	8.21E+05	706	9.76E+01	ALT (KM)
5	2.03E+08	67	8.57E+03	1011	2.22E+00	9.351
7	1.53E+08	87	1.53E+04	1316	0.	TEMP (C)
9	1.08E+08	108	2.77E+04	1622	0.	-33.5
11	8.56E+07	128	1.54E+04	1927	0.	FROSTPOINT
12	5.91E+07	148	6.09E+03	2233	0.	-34.1
14	6.43E+07	169	1.08E+04	2538	0.	TAS (M/S)
16	6.02E+07	189	2.43E+04	2843	0.	124.3
18	2.83E+07	209	2.36E+04	3149	0.	TOTALS
19	2.56E+07	230	2.70E+04	3454	0.	4.17E-03
21	1.99E+07	250	2.04E+04	3760	0.	190
23	2.32E+07	271	2.63E+04	4065	0.	
25	2.07E+07	291	3.38E+04	4370	0.	
27	1.77E+07	311	2.54E+04	4676	0.	
IWC MED D	2.30E-03		3.41E-03			

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL START:17:45:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MM)
2	1.47E+08	26	6.91E+05	1.62E+03	339.9
3	2.29E+08	47	1.10E+06	3.11E+01	ALT (KM)
5	1.75E+08	67	1.28E+06	5.55E-01	6.337
7	1.29E+08	87	5.08E+04	0.	TEMP (C)
9	9.27E+07	108	7.95E+04	1622 0.	-33.3
11	7.31E+07	128	6.53E+04	1927 0.	FROSTPOINT
12	6.12E+07	148	4.94E+04	2233 0.	-33.0
14	5.65E+07	169	2.74E+04	2538 0.	TAS (M/S)
16	4.59E+07	189	4.31E+04	2843 0.	124.7
18	2.88E+07	209	3.62E+04	3149 0.	TOTALS
19	2.58E+07	230	1.94E+04	3454 0.	1.53E-03
21	1.93E+07	250	1.08E+04	3760 0.	197
23	1.71E+07	271	1.22E+04	4065 0.	86
25	1.77E+07	291	1.37E+04	4370 0.	3.03E-03
27	1.17E+07	311	1.02E+04	4676 0.	19
IWC	1.93E-03		3.03E-03	1.53E-03	19
MED D					

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL START:17:45:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MM)
2	1.65E+08	26	5.97E+05	9.70E+03	339.8
3	2.16E+08	47	1.50E+06	3.22E+02	ALT (KM)
5	1.61E+08	67	1.30E+06	1.23E+01	0.317
7	1.40E+08	87	2.06E+04	1.18E+00	TEMP (C)
9	9.21E+07	108	5.28E+04	0.	-33.1
11	7.20E+07	128	6.50E+03	1927 0.	FROSTPOINT
12	5.44E+07	148	9.20E+03	2233 0.	-33.5
14	5.35E+07	169	5.06E+03	2538 0.	TAS (M/S)
16	4.96E+07	189	2.65E+04	2843 0.	122.8
18	2.34E+07	209	6.36E+04	3149 0.	TOTALS
19	1.90E+07	230	7.11E+04	3454 0.	1.00E-02
21	1.65E+07	250	4.62E+04	3760 0.	202
23	1.41E+07	271	5.35E+04	4065 0.	117
25	1.65E+07	291	6.20E+04	4370 0.	6.65E-03
27	1.16E+07	311	4.79E+04	4676 0.	19
IWC	1.79E-03		6.65E-03	1.00E-02	19
MED D					

INTERVAL START:17:45:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MM)
2	1.28E+08	26	4.16E+05	3.00E+03	339.5
3	2.29E+08	47	9.11E+05	9.96E+01	ALT (KM)
5	1.97E+08	67	1.28E+06	1.11E+00	8.324
7	1.39E+08	87	3.30E+04	0.	TEMP (C)
9	9.73E+07	108	4.15E+04	1622 0.	-33.2
11	8.51E+07	128	2.43E+04	1927 0.	FROSTPOINT
12	5.53E+07	148	3.33E+04	2233 0.	-33.0
14	5.86E+07	169	1.25E+04	2538 0.	TAS (M/S)
16	5.73E+07	189	3.50E+04	2843 0.	124.3
18	3.24E+07	209	2.75E+04	3149 0.	TOTALS
19	2.70E+07	230	2.59E+04	3454 0.	3.04E-03
21	1.85E+07	250	1.64E+04	3760 0.	201
23	1.88E+07	271	1.66E+04	4065 0.	101
25	1.77E+07	291	1.90E+04	4370 0.	2.08E-03
27	1.89E+07	311	1.47E+04	4676 0.	20
IWC	2.16E-03		2.08E-03	3.04E-03	20
MED D					

INTERVAL START:17:46:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MM)
2	1.88E+08	26	4.21E+05	3.68E+03	340.1
3	2.14E+08	47	8.68E+05	2.73E+01	ALT (KM)
5	1.60E+08	67	1.74E+06	5.61E-01	8.311
7	1.30E+08	87	3.87E+04	1316 0.	TEMP (C)
9	9.43E+07	108	2.61E+04	1622 0.	-33.2
11	7.23E+07	128	1.30E+04	1927 0.	FROSTPOINT
12	4.85E+07	148	4.10E+03	2233 0.	-33.2
14	4.91E+07	169	5.90E+03	2538 0.	TAS (M/S)
16	3.92E+07	189	2.10E+04	2843 0.	122.8
18	2.04E+07	209	3.48E+04	3149 0.	TOTALS
19	1.82E+07	230	4.01E+04	3454 0.	3.26E-03
21	1.19E+07	250	4.98E+04	3760 0.	193
23	1.30E+07	271	5.11E+04	4065 0.	131
25	1.30E+07	291	5.24E+04	4370 0.	
27	1.02E+07	311	3.62E+04	4676 0.	
IWC	1.55E-03		5.31E-03	3.26E-03	
MED D					

AFML CIRRHUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 50 SECOND AVERAGING
INTERVAL STARTS:17:46:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (49)
2	1.90E+08	26	3.90E+05	4.83E+03	339.4
3	2.04E+08	47	7.94E+05	6.87E+01	ALT (KM)
5	1.47E+08	67	4.36E+03	1011	8.326
7	1.39E+08	87	3.14E+04	1316	0.
9	8.35E+07	108	2.48E+04	1622	TEMP (C)
11	7.57E+07	128	1.31E+04	1927	-33.4
12	5.05E+07	148	4.14E+03	2233	0.
14	4.70E+07	169	3.40E+03	2538	0.
15	3.66E+07	189	1.01E+04	2843	0.
18	2.62E+07	209	1.21E+04	3149	0.
19	2.09E+07	230	3.65E+04	3454	0.
21	1.37E+07	250	2.95E+04	3760	0.
23	1.56E+07	271	3.79E+04	4065	0.
25	1.51E+07	291	4.67E+04	4370	0.
27	1.17E+07	311	3.53E+04	4676	0.
IMC	1.70E-03		4.23E-03	4.49E-03	TOTALS
MED D	19		122	156	8.72E-03
					144

AFML CIRRHUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS:17:47:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (49)
2	2.73E+08	26	3.64E+05	5.52E+03	338.2
3	1.97E+08	47	6.78E+05	1.87E+02	ALT (KM)
5	1.39E+08	67	2.69E+04	1011	8.349
7	1.07E+08	87	1.34E+04	1316	0.
9	7.46E+07	108	4.18E+04	1622	TEMP (C)
11	5.97E+07	128	1.21E+04	1927	-33.6
12	4.34E+07	148	3.17E+03	2233	0.
14	4.29E+07	169	2.61E+03	2538	0.
16	4.09E+07	189	8.47E+03	2843	0.
18	1.97E+07	209	8.21E+03	3149	0.
19	1.40E+07	230	1.47E+04	3454	0.
21	1.23E+07	250	1.00E+04	3760	0.
23	1.08E+07	271	1.87E+04	4065	0.
25	1.03E+07	291	3.48E+04	4370	0.
27	9.13E+06	311	2.69E+04	4676	0.
IMC	1.77E-03		2.76E-03	5.69E-03	TOTALS
MED D	18		124	202	8.45E-03
					172

INTERVAL STARTS:17:47:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (49)
2	2.30E+08	26	3.97E+05	4.49E+03	338.3
3	2.03E+08	47	7.79E+05	6.01E+01	ALT (KM)
5	1.53E+08	67	4.44E+03	1011	8.347
7	1.14E+08	87	1.06E+04	1316	0.
9	8.33E+07	108	2.17E+04	1622	TEMP (C)
11	6.14E+07	128	1.07E+04	1927	-33.6
12	5.14E+07	148	3.16E+03	2233	0.
14	4.29E+07	169	1.74E+03	2538	0.
16	4.35E+07	189	1.03E+04	2843	0.
18	2.53E+07	209	2.45E+04	3149	0.
19	1.76E+07	230	2.59E+04	3454	0.
21	1.14E+07	250	2.50E+04	3760	0.
23	1.56E+07	271	3.42E+04	4065	0.
25	1.42E+07	291	4.67E+04	4370	0.
27	1.08E+07	311	3.37E+04	4676	0.
IMC	1.61E-03		3.94E-03	4.13E-03	TOTALS
MED D	19		122	195	8.07E-03
					143

INTERVAL STARTS:17:48:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (49)
2	2.44E+08	26	1.47E+05	1.83E+03	339.1
3	2.18E+08	47	1.64E+05	7.61E+01	ALT (KM)
5	1.74E+08	67	0.	1011	8.350
7	1.11E+08	87	2.70E+03	1316	0.
9	8.43E+07	108	2.02E+04	1622	TEMP (C)
11	8.46E+07	128	4.08E+03	1927	-33.8
12	5.19E+07	148	2.14E+03	2233	0.
14	4.96E+07	169	1.77E+03	2538	0.
16	3.64E+07	189	2.86E+03	2843	0.
18	2.02E+07	209	1.04E+03	3149	0.
19	1.37E+07	230	1.14E+03	3454	0.
21	1.20E+07	250	2.54E+03	3760	0.
23	1.04E+07	271	5.12E+03	4065	0.
25	1.10E+07	291	1.03E+04	4370	0.
27	9.24E+06	311	8.12E+03	4676	0.
IMC	1.41E-03		7.75E-04	1.96E-03	TOTALS
MED D	16		125	204	2.73E-03
					179

AFWL CIRRHUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS:17:48:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MM)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MM)
2	2.96E+08	26	7.35E+04	437	3.66E+02	338.3	2	2.60E+08	26	9.45E+05	465	3.55E+02	339.8
3	2.01E+08	47	5.80E+04	706	4.81E+01	8.347	3	1.98E+08	43	1.14E+06	743	9.63E-01	ALT (KM)
5	1.35E+08	67	0.	1011	0.	0.	5	1.40E+08	72	1.17E+04	1088	0.	8.316
7	1.05E+08	87	2.71E+03	1316	0.	TEMP (C)	7	1.03E+06	95	2.09E+04	1433	0.	TEMP (C)
9	7.13E+07	108	0.	1622	0.	-33.9	9	7.68E+07	118	3.19E+04	1778	0.	-33.7
11	5.46E+07	128	1.36E+03	1927	0.	FROSTPOINT	11	6.17E+07	141	5.37E+04	2123	0.	FROSTPOINT
12	4.27E+07	148	1.07E+03	2233	0.	-32.7	12	4.51E+07	164	7.31E+04	2468	0.	-33.4
14	3.55E+07	168	0.	2538	0.	0.	14	4.12E+07	187	5.46E+04	2813	0.	0.
16	2.60E+07	189	0.	2843	0.	TAS (M/S)	16	3.59E+07	210	9.30E+04	3158	0.	TAS (M/S)
19	1.16E+07	209	1.04E+03	3149	0.	117.3	19	2.49E+07	233	4.37E+04	3503	0.	121.9
21	9.25E+06	230	3.43E+03	3454	0.	TOTALS	21	1.63E+07	256	3.14E+04	3848	0.	TOTALS
23	4.62E+06	250	0.	3760	0.	6.89E-04	23	1.46E+07	279	1.31E+04	4193	0.	9.26E-03
25	5.20E+05	271	5.46E+02	4065	0.	22.2	25	1.26E+07	302	7.98E+03	4538	0.	217
27	4.04E+06	311	9.38E+02	4676	0.	101	27	1.18E+07	325	4.37E+03	4883	0.	118
IMC	8.72E-04		1.50E-04		5.39E-04	204	IMC	1.54E-03		9.00E-03		2.61E-04	
MED D	16		111		22.2	20	MED D	20		117		217	

INTERVAL STARTS:17:48:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MM)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MM)
2	3.42E+08	26	0.	437	1.81E+02	333.9	2	3.54E+08	26	2.76E+06	465	5.58E+03	340.3
3	1.97E+08	47	2.85E+04	706	3.03E+01	ALT (KM)	3	1.54E+08	49	2.50E+05	743	0.	ALT (KM)
5	1.26E+08	67	0.	1011	5.79E-01	8.335	5	1.42E+08	72	3.10E+04	1088	0.	8.308
7	8.83E+07	87	0.	1316	6.08E-01	TEMP (C)	7	8.37E+07	95	6.46E+04	1433	0.	TEMP (C)
9	6.18E+07	108	0.	1622	0.	-33.9	9	6.70E+07	118	1.60E+05	1778	0.	-33.6
11	4.02E+07	128	0.	1927	0.	FROSTPOINT	11	5.19E+07	141	1.38E+05	2123	0.	FROSTPOINT
12	3.13E+07	148	1.06E+03	2233	0.	-32.4	12	3.85E+07	164	1.36E+05	2468	0.	-32.7
14	2.62E+07	168	0.	2538	0.	0.	14	3.99E+07	187	9.29E+04	2813	0.	0.
16	1.91E+07	189	9.33E+02	2843	0.	TAS (M/S)	16	2.60E+07	210	1.92E+05	3158	0.	TAS (M/S)
19	9.39E+06	209	0.	3149	0.	119.0	19	1.67E+07	233	1.06E+05	3503	0.	121.4
21	7.97E+06	230	1.26E+03	3454	0.	TOTALS	21	1.09E+07	256	4.79E+04	3848	0.	TOTALS
23	7.11E+06	250	0.	3760	0.	3.98E-04	23	1.40E+07	279	2.50E+04	4193	0.	217
25	2.56E+05	271	4.70E+02	4065	0.	113	25	1.20E+07	302	1.12E+04	4538	0.	126
27	4.55E+06	311	4.12E+02	4676	0.	223	27	8.37E+06	325	9.96E+03	4883	0.	
IMC	7.43E-04		7.45E-05		3.24E-04	250	IMC	1.29E-03		1.82E-02		5.51E-03	
MED D	17		113		250	20	MED D	20		118		217	

AFWL CIRRHUS STUDY 9Y AFGL									
FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING									
INTERVAL STARTS:17151100*									
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)									
TYPE: SMALL SNOW									
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (49)	SIZE (MU)	CLOUD PROBE	PRECIP PROBE
2	2.48E+00	26	1.00E+06	465	1.10E+03	340.3	26	1.25E+05	465
3	2.03E+00	49	9.16E+05	743	0.		49	6.20E+04	743
5	1.89E+00	72	3.88E+03	1088	0.	ALT (KM)	72	7.69E+03	1088
7	1.83E+00	95	4.15E+04	1433	0.	9.306	95	4.59E+03	1433
9	8.62E+07	118	1.33E+05	1778	0.	TEMP (C)	118	1.56E+03	1778
11	6.70E+07	141	7.90E+04	2123	0.	-33.6	141	6.32E+03	2123
12	5.70E+07	164	5.76E+04	2468	0.		164	2.73E+03	2468
14	5.24E+07	187	2.94E+04	2813	0.	FROSTPOINT	187	7.49E+02	2813
16	4.76E+07	210	2.94E+04	3158	0.	-33.2	210	4.04E+03	3158
18	3.66E+07	233	5.64E+04	3503	0.		233	6.82E+02	3503
19	2.06E+07	256	1.27E+04	3848	0.	TAS (M/S)	256	0.	3848
21	2.06E+07	279	1.04E+04	4193	0.	121.8	279	0.	4193
23	1.89E+07	302	5.07E+03	4538	0.		302	0.	4538
25	1.78E+07	325	2.36E+03	4883	0.		325	0.	4883
27	1.25E+07	348	2.11E+03	5228	0.		348	0.	5228
TOTALS									
IMC MED D	1.94E-03	20	6.82E-03	114	1.16E-03	8.00E-03	20	3.09E-04	90
					217	118			90

AFWL CIRRHUS STUDY 9Y AFGL									
FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING									
INTERVAL STARTS:17151100*									
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)									
TYPE: SMALL SNOW									
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (49)	SIZE (MU)	CLOUD PROBE	PRECIP PROBE
2	1.88E+00	26	1.87E+05	465	1.03E+02	343.5	26	0.	0.
3	2.75E+00	49	1.72E+05	743	4.76E-01		49	0.	0.
5	1.83E+00	72	7.70E+03	1088	0.	ALT (KM)	72	0.	0.
7	1.33E+00	95	9.16E+03	1433	0.	9.304	95	0.	0.
9	8.59E+07	118	3.42E+04	1778	0.	TEMP (C)	118	0.	0.
11	6.63E+07	141	1.39E+04	2123	0.	-33.6	141	0.	0.
12	5.19E+07	164	1.30E+04	2468	0.		164	0.	0.
14	5.66E+07	187	6.00E+03	2813	0.	FROSTPOINT	187	0.	0.
16	4.82E+07	210	5.15E+03	3158	0.	-33.1	210	0.	0.
18	3.82E+07	233	7.96E+03	3503	0.		233	0.	0.
19	2.58E+07	256	5.35E+03	3848	0.	TAS (M/S)	256	0.	0.
21	1.86E+07	279	1.05E+03	4193	0.	122.2	279	0.	0.
23	2.76E+07	302	5.70E+02	4538	0.		302	0.	0.
25	2.05E+07	325	8.65E+02	4883	0.		325	0.	0.
27	1.72E+07	348	6.13E+02	5228	0.		348	0.	0.
TOTALS									
IMC MED D	2.20E-03	20	1.40E-03	115	7.44E-03	1.47E-03	20	0.	0
					219	117			0

AFML CIRRUS STUDY 9Y AFGL

FLIGHT 778-09 ON 21 MAR 78 3C SECOND AVERAGING
INTERVAL START:17153300*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: SMALL SNOW

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (49)
2	1.63E+06	26	0.	465	0.	340.0
3	3.70E+06	49	0.	743	0.	
5	2.82E+06	72	0.	1088	0.	ALT (KM)
7	2.20E+06	95	0.	1433	0.	8.312
9	1.44E+06	118	0.	1778	0.	TEMP (C)
11	1.03E+06	141	0.	2123	0.	-33.5
12	7.77E+07	164	0.	2468	0.	FROSTPOINT
14	8.18E+07	187	0.	2813	0.	-33.7
16	7.61E+07	210	0.	3158	0.	
18	3.95E+07	233	0.	3503	0.	TAS (M/S)
19	2.67E+07	256	0.	3848	0.	121.7
21	1.86E+07	279	0.	4193	0.	
23	1.84E+07	302	0.	4538	0.	
25	1.73E+07	325	0.	4883	0.	
27	8.08E+05	348	0.	5228	0.	
TOTALS						
TWC	2.29E-03	0.	0.	0.	0.	0.
WED D	17					

AFML CIRRUS STUDY 9Y AFGL

FLIGHT 778-09 ON 21 MAR 78 3C SECOND AVERAGING
INTERVAL START:17154100*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: SMALL SNOW

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (49)
2	3.51E+08	26	0.	465	3.02E-01	339.4
3	2.98E+08	49	8.42E+03	743	4.82E-01	
5	2.00E+08	72	0.	1088	5.06E-01	ALT (KM)
7	1.49E+08	95	0.	1433	0.	6.324
9	1.06E+08	118	0.	1778	0.	TEMP (C)
11	8.87E+07	141	0.	2123	0.	-33.4
12	5.15E+07	164	0.	2468	0.	FROSTPOINT
14	5.63E+07	187	0.	2813	0.	-34.0
16	4.45E+07	210	0.	3158	0.	
18	2.08E+07	233	0.	3503	0.	TAS (M/S)
19	1.24E+07	256	0.	3848	0.	120.3
21	9.28E+06	279	0.	4193	0.	
23	7.22E+06	302	0.	4538	0.	
25	8.16E+06	325	0.	4883	0.	
27	4.50E+06	348	0.	5228	0.	
TOTALS						
TWC	1.33E-03	16	5.45E-06	32	9.41E-06	1.41E-05
WED D	16				369	290

INTERVAL START:17153300*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: SMALL SNOW

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (49)
2	2.94E+08	26	0.	465	0.	333.8
3	2.98E+08	49	0.	743	0.	
5	2.04E+08	72	0.	1088	0.	ALT (KM)
7	1.49E+08	95	0.	1433	0.	8.318
9	1.06E+08	118	0.	1778	0.	TEMP (C)
11	8.87E+07	141	0.	2123	0.	-33.4
12	5.62E+07	164	0.	2468	0.	FROSTPOINT
14	6.07E+07	187	0.	2813	0.	-33.5
16	4.76E+07	210	0.	3158	0.	
18	2.01E+07	233	0.	3503	0.	TAS (M/S)
19	1.68E+07	256	0.	3848	0.	121.1
21	1.46E+07	279	0.	4193	0.	
23	1.66E+07	302	0.	4538	0.	
25	7.50E+06	325	0.	4883	0.	
27	4.75E+06	348	0.	5228	0.	
TOTALS						
TWC	1.43E-03	0.	0.	0.	0.	0.
WED D	16					

INTERVAL START:17154100*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: SMALL SNOW

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (49)
2	4.84E+08	26	1.57E+06	465	4.17E+02	338.5
3	1.67E+08	49	5.38E+05	743	9.29E+00	
5	1.28E+08	72	5.54E+04	1088	0.	ALT (KM)
7	8.90E+07	95	9.43E+04	1433	0.	8.343
9	7.10E+07	118	1.52E+05	1778	0.	TEMP (C)
11	5.19E+07	141	3.92E+04	2123	0.	-33.6
12	3.65E+07	164	1.40E+04	2468	0.	FROSTPOINT
14	4.25E+07	187	4.63E+03	2813	0.	-33.6
16	1.62E+07	211	5.33E+03	3158	0.	
18	1.61E+07	233	1.81E+03	3503	0.	TAS (M/S)
19	1.43E+07	256	0.	3848	0.	118.9
21	1.51E+07	279	1.11E+03	4193	0.	
23	1.43E+07	302	1.73E+03	4538	0.	
25	1.48E+07	325	2.69E+03	4883	0.	
27	8.56E+06	348	1.96E+03	5228	0.	
TOTALS						
TWC	1.44E-03	20	2.92E-03	75	4.25E-04	3.35E-03
WED D	20				221	79

AFML CIRCUIT STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL START:17155100*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: SMALL SNOW

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (49)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (49)
2	4.36E+08	26	9.31E+05	465	4.24E+02	333.3	2	4.52E+08	26	5.04E+05	465	6.59E+02	339.1
3	1.82E+08	49	4.04E+05	743	7.32E+00		3	2.25E+08	49	4.48E+05	743	1.87E+01	
5	1.28E+08	72	4.76E+04	1088	0.	8.348	5	1.62E+08	72	1.17E+04	1088	0.	8.331
7	9.32E+07	95	5.89E+04	1433	0.		7	1.07E+08	95	1.85E+04	1433	0.	
9	7.42E+07	118	1.44E+05	1778	0.		9	7.80E+07	118	4.86E+04	1778	0.	
11	6.36E+07	141	1.54E+04	2123	0.	-33.7	11	6.32E+07	141	5.13E+04	2123	0.	-33.7
12	4.83E+07	164	6.52E+03	2468	0.		12	4.81E+07	164	5.05E+04	2468	0.	
14	4.77E+07	187	6.34E+02	2813	0.		14	4.75E+07	187	2.35E+04	2813	0.	
16	4.20E+07	210	9.16E+02	3158	0.	-33.1	16	3.86E+07	210	6.17E+04	3158	0.	
18	2.70E+07	233	2.00E+03	3503	0.		18	1.73E+07	233	2.58E+04	3503	0.	
19	1.93E+07	256	2.00E+03	3848	0.		19	1.71E+07	256	1.27E+04	3848	0.	
21	1.70E+07	279	1.12E+03	4193	0.	113.2	21	1.71E+07	279	5.44E+03	4193	0.	121.3
23	1.55E+07	302	1.85E+03	4538	0.		23	1.70E+07	302	4.59E+03	4538	0.	
25	1.53E+07	325	3.07E+03	4883	0.		25	1.62E+07	325	3.86E+03	4883	0.	
27	1.14E+07	348	2.22E+03	5228	0.		27	1.63E+07	348	2.89E+03	5228	0.	
TOTALS							TOTALS						
IMC	1.71E-03		2.00E-03		4.14E-04	2.42E-03	IMC	1.60E-03		5.18E-03		6.99E-04	5.88E-03
MED D	20		76		220	80	MED D	20		117		222	120

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AFML CIRCUIT STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL START:17156100*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: SMALL SNOW

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (49)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (49)
2	4.76E+08	26	1.36E+06	465	3.78E+02	338.6	2	4.59E+08	26	7.22E+05	465	6.68E+02	339.1
3	1.75E+08	49	6.56E+05	743	1.01E+01		3	1.97E+08	49	5.12E+05	743	1.82E+01	
5	1.25E+08	72	1.96E+04	1088	0.	9.341	5	1.49E+08	72	1.16E+04	1088	0.	8.331
7	1.02E+08	95	7.45E+04	1433	0.		7	1.40E+08	95	1.61E+04	1433	0.	
9	6.47E+07	118	1.55E+05	1778	0.		9	8.59E+07	118	2.53E+04	1778	0.	
11	5.28E+07	141	8.57E+04	2123	0.	-33.7	11	5.94E+07	141	1.28E+04	2123	0.	-33.7
12	3.46E+07	164	4.34E+04	2468	0.		12	3.65E+07	164	2.29E+04	2468	0.	
14	4.36E+07	187	1.45E+04	2813	0.		14	4.24E+07	187	2.57E+04	2813	0.	
16	3.79E+07	210	1.88E+03	3158	0.	-33.4	16	4.07E+07	210	8.15E+04	3158	0.	-32.3
18	2.80E+07	233	4.48E+03	3503	0.		18	1.90E+07	233	6.49E+04	3503	0.	
19	1.86E+07	256	3.95E+03	3848	0.		19	1.70E+07	256	4.40E+04	3848	0.	
21	1.49E+07	279	1.10E+03	4193	0.	120.5	21	1.28E+07	279	2.28E+04	4193	0.	121.5
23	1.32E+07	302	1.57E+03	4538	0.		23	1.73E+07	302	9.55E+03	4538	0.	
25	1.44E+07	325	2.23E+03	4883	0.		25	1.37E+07	325	4.00E+03	4883	0.	
27	1.32E+07	348	1.67E+03	5228	0.		27	9.46E+06	348	2.98E+03	5228	0.	
TOTALS							TOTALS						
IMC	1.54E-03		4.06E-03		3.94E-04	4.46E-03	IMC	1.52E-03		7.81E-03		7.04E-04	6.52E-03
MED D	20		86		222	89	MED D	20		120		222	130

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL START:17157:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: SMALL SNOW

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (M9)
2	4.21E+08	26	6.25E+05	465	1.94E+03	333.2
3	2.14E+08	49	5.51E+05	743	4.04E+01	
5	1.68E+08	72	1.16E+04	1088	0.	8.330
7	1.35E+08	95	1.84E+04	1433	0.	
9	7.99E+07	118	2.81E+04	1778	0.	TEMP (C)
11	5.91E+07	141	1.39E+04	2123	0.	-33.6
12	4.52E+07	164	2.64E+04	2468	0.	
14	5.33E+07	187	1.58E+04	2813	0.	FROSTPOINT
16	4.30E+07	210	6.48E+04	3158	0.	-32.9
18	2.22E+07	233	4.69E+04	3503	0.	
19	1.78E+07	256	2.14E+04	3848	0.	TAS (M/S)
21	1.58E+07	279	1.19E+04	4193	0.	123.1
23	1.69E+07	302	1.27E+04	4538	0.	
25	1.58E+07	325	1.35E+04	4883	0.	
27	1.50E+07	348	9.79E+03	5228	0.	TOTALS
IWC	1.77E-03	20	6.89E-03	130	1.97E-03	8.86E-03
MED D					221	141

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL START:17158:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (M9)
2	4.23E+08	26	1.05E+05	437	4.72E+02	339.2
3	2.88E+08	47	5.51E+04	706	8.51E+00	
5	1.77E+08	67	4.34E+03	1011	0.	ALT (KM)
7	1.32E+08	87	2.56E+03	1316	0.	8.349
9	8.38E+07	108	0.	1622	0.	TEMP (C)
11	5.51E+07	128	0.	1927	0.	-34.2
12	4.34E+07	148	1.32E+03	2233	0.	
14	3.76E+07	169	0.	2538	0.	FROSTPOINT
15	7.88E+07	189	2.72E+03	2843	0.	-32.6
18	1.95E+07	209	2.97E+03	3149	0.	
19	1.76E+07	230	1.09E+03	3454	0.	TAS (M/S)
21	9.67E+06	250	3.63E+03	3760	0.	123.3
23	1.10E+07	271	3.79E+03	4065	0.	
25	8.79E+06	291	3.97E+03	4370	0.	
27	5.22E+06	311	2.95E+03	4676	0.	TOTALS
IWC	1.28E-03	18	3.87E-04	119	4.35E-04	8.22E-04
MED D					196	147

INTERVAL START:17158:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (M9)
2	3.21E+08	26	2.09E+05	437	8.38E+02	338.6
3	2.84E+08	47	1.15E+05	706	1.43E+01	
5	2.01E+08	67	0.	1011	0.	ALT (KM)
7	1.32E+08	87	0.	1316	0.	8.341
9	9.80E+07	108	5.23E+03	1622	0.	TEMP (C)
11	7.79E+07	128	1.03E+03	1927	0.	-34.0
12	5.08E+07	148	2.03E+03	2233	0.	
14	5.35E+07	169	6.39E+02	2538	0.	FROSTPOINT
16	5.21E+07	189	2.72E+03	2843	0.	-32.3
18	2.44E+07	209	9.86E+03	3149	0.	
19	2.71E+07	230	6.52E+03	3454	0.	TAS (M/S)
21	1.54E+07	250	1.21E+03	3760	0.	123.5
23	1.78E+07	271	2.99E+03	4065	0.	
25	1.59E+07	291	7.41E+03	4370	0.	
27	1.40E+07	311	5.47E+03	4676	0.	TOTALS
IWC	1.88E-03	19	6.54E-04	120	7.74E-04	1.43E-03
MED D					196	149

INTERVAL START:17159:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (M9)
2	2.19E+08	26	0.	437	2.38E+02	337.8
3	2.95E+08	47	3.69E+04	706	5.87E+00	
5	2.38E+08	67	0.	1011	0.	ALT (KM)
7	1.91E+08	87	0.	1316	0.	8.357
9	1.35E+08	108	3.50E+03	1622	0.	TEMP (C)
11	1.13E+08	128	0.	1927	0.	-34.3
12	8.34E+07	148	0.	2233	0.	
14	1.00E+08	169	9.12E+02	2538	0.	FROSTPOINT
16	1.05E+08	189	9.98E+02	2843	0.	-32.5
18	5.98E+07	209	9.98E+02	3149	0.	
19	4.41E+07	230	0.	3454	0.	TAS (M/S)
21	3.22E+07	250	0.	3760	0.	123.1
23	3.69E+07	271	8.23E+02	4065	0.	
25	3.39E+07	291	1.69E+03	4370	0.	
27	3.60E+07	311	1.26E+03	4676	0.	TOTALS
IWC	3.73E-03	20	1.21E-04	125	2.25E-04	3.47E-04
MED D					198	167

AFML CIRRHUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS:1759300
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MM)
2	2.01E+00	26	7.06E+04	437	1.29E+03	337.6
3	2.81E+00	47	1.11E+05	706	1.62E+01	ALT (KM)
5	2.27E+00	67	4.35E+03	1011	0.	8.362
7	1.91E+00	87	5.16E+03	1316	0.	TEMP (C)
9	1.36E+00	108	1.23E+04	1622	0.	-36.4
11	1.20E+00	128	3.90E+03	1927	0.	FROSTPOINT
12	9.30E+07	148	0.	2233	0.	-32.0
14	1.08E+00	169	8.43E+02	2538	0.	TAS (M/S)
16	1.07E+00	189	9.20E+02	2843	0.	122.4
18	6.06E+07	209	2.00E+03	3149	0.	TOTALS
19	4.76E+07	230	6.59E+03	3454	0.	1.18E-03
21	3.78E+07	250	4.89E+03	3760	0.	1.95
23	4.37E+07	271	7.91E+03	4065	0.	125
25	4.34E+07	291	1.22E+04	4370	0.	9.45E-04
27	4.37E+07	311	9.28E+03	4676	0.	2.12E-03
IMC	4.39E-03					151
MED D	21					195

INTERVAL STARTS:19101000
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MM)
2	1.93E+00	26	2.12E+05	437	1.21E+03	337.7
3	3.06E+00	47	1.30E+05	706	1.40E+01	ALT (KM)
5	2.58E+00	67	1.31E+04	1011	0.	9.358
7	1.96E+00	87	0.	1316	0.	TEMP (C)
9	1.45E+00	108	7.06E+03	1622	0.	-36.3
11	1.10E+00	128	6.54E+03	1927	0.	FROSTPOINT
12	8.36E+07	148	1.03E+03	2233	0.	-32.6
14	9.44E+07	169	1.70E+03	2538	0.	TAS (M/S)
16	1.07E+00	189	1.83E+03	2843	0.	122.1
18	6.44E+07	209	3.99E+03	3149	0.	TOTALS
19	4.28E+07	230	7.69E+03	3454	0.	1.09E-03
21	3.83E+07	250	6.11E+03	3760	0.	1.95
23	3.75E+07	271	8.99E+03	4065	0.	123
25	3.58E+07	291	1.32E+04	4370	0.	1.06E-03
27	3.44E+07	311	9.49E+03	4676	0.	2.09E-03
IMC	3.92E-03					142
MED D	20					195

AFML CIRRHUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS:19101000
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MM)
2	2.09E+00	26	7.06E+04	437	7.22E+02	338.0
3	3.15E+00	47	2.79E+04	706	4.89E+01	ALT (KM)
5	2.58E+00	67	0.	1011	5.63E-01	8.353
7	1.65E+00	87	0.	1316	0.	TEMP (C)
9	1.39E+00	108	1.76E+03	1622	0.	-36.3
11	1.17E+00	128	0.	1927	0.	FROSTPOINT
12	7.83E+07	148	0.	2233	0.	-32.7
14	8.33E+07	169	1.83E+03	2538	0.	TAS (M/S)
16	9.88E+07	189	2.00E+03	2843	0.	122.1
18	4.47E+07	209	1.10E+03	3149	0.	TOTALS
19	4.47E+07	230	3.67E+03	3454	0.	1.17E-03
21	3.33E+07	250	3.37E+03	3760	0.	185
23	2.72E+07	271	3.37E+03	4065	0.	3.54E-04
25	2.64E+07	291	3.10E+03	4370	0.	211
27	2.66E+07	311	2.53E+03	4676	0.	2.98E-04
IMC	3.30E-03					301
MED D	20					294

INTERVAL STARTS:19101000
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MM)
2	2.16E+00	26	3.54E+04	437	3.51E+01	338.0
3	3.38E+00	47	9.32E+03	706	5.67E+01	ALT (KM)
5	2.69E+00	67	4.37E+03	1011	0.	8.353
7	1.07E+00	87	2.59E+03	1316	0.	TEMP (C)
9	1.61E+00	108	0.	1622	0.	-36.2
11	1.07E+00	128	0.	1927	0.	FROSTPOINT
12	8.92E+07	148	0.	2233	0.	-32.3
14	8.89E+07	169	8.52E+02	2538	0.	TAS (M/S)
16	7.58E+07	189	0.	2843	0.	121.6
18	4.29E+07	209	1.00E+03	3149	0.	TOTALS
19	3.69E+07	230	0.	3454	0.	2.98E-04
21	2.65E+07	250	0.	3760	0.	301
23	2.68E+07	271	0.	4065	0.	294
25	2.34E+07	291	0.	4370	0.	
27	2.15E+07	311	0.	4676	0.	
IMC	2.97E-03					
MED D	19					

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING

INTERVAL START: 18102130*

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)

TYPE: RULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (49)
2	2.24E+08	26	3.54E+04	437	4.68E+02	333.3
3	3.42E+08	47	9.32E+03	706	1.19E+02	
5	2.87E+08	67	4.37E+03	1011	5.66E-01	ALT (KM)
7	1.86E+08	87	2.61E+03	1316	0.	8.346
9	1.36E+08	108	1.77E+03	1622	0.	TEMP (C)
11	1.00E+08	128	0.	1927	0.	-34.2
12	7.71E+07	148	0.	2233	0.	
14	7.57E+07	169	0.	2538	0.	FROSTPOINT
16	7.83E+07	189	9.20E+02	2843	0.	-32.7
18	4.15E+07	209	1.00E+03	3149	0.	
19	3.79E+07	230	0.	3454	0.	TAS (M/S)
21	2.70E+07	250	1.23E+03	3760	0.	121.7
23	2.65E+07	271	1.10E+03	4065	0.	
25	2.81E+07	291	9.95E+02	4370	0.	TOTALS
27	2.03E+07	311	8.89E+02	4676	0.	1.08E-03
IWC MED D	2.94E-03		1.16E-04		9.69E-04	248
	20		117		262	

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING

INTERVAL START: 18102130*

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)

TYPE: RULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (49)
2	1.80E+08	26	7.06E+04	437	2.48E+02	338.7
3	3.54E+08	47	9.27E+03	706	6.45E+00	ALT (KM)
5	2.81E+08	67	0.	1011	5.64E-01	8.339
7	2.26E+08	87	0.	1316	0.	TEMP (C)
9	1.53E+08	108	3.53E+03	1622	0.	-34.2
11	1.19E+08	128	0.	1927	0.	
12	1.04E+08	148	0.	2233	0.	FROSTPOINT
14	1.01E+08	169	8.48E+02	2538	0.	-32.7
15	8.80E+07	189	0.	2843	0.	
18	4.94E+07	209	0.	3149	0.	TAS (M/S)
19	4.27E+07	230	0.	3454	0.	122.2
21	4.22E+07	250	0.	3760	0.	
23	3.97E+07	271	8.40E+02	4065	0.	TOTALS
25	3.72E+07	291	1.68E+03	4370	0.	3.56E-04
27	3.36E+07	311	1.29E+03	4676	0.	173
IWC MED D	3.93E-03		1.11E-04		2.45E-04	201
	21		127			

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING

INTERVAL START: 18102130*

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)

TYPE: RULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (49)
2	2.40E+08	26	7.07E+04	437	6.04E+02	338.6
3	3.58E+08	47	4.55E+04	706	1.88E+01	ALT (KM)
5	2.86E+08	67	0.	1011	1.13E+00	8.341
7	2.04E+08	87	2.60E+03	1316	0.	TEMP (C)
9	1.47E+08	108	5.30E+03	1622	0.	-34.2
11	1.16E+08	128	2.62E+03	1927	0.	
12	8.22E+07	148	1.03E+03	2233	0.	FROSTPOINT
14	9.22E+07	169	8.48E+02	2538	0.	-32.8
16	7.83E+07	189	0.	2843	0.	
18	4.97E+07	209	0.	3149	0.	TAS (M/S)
19	3.95E+07	230	0.	3454	0.	122.0
21	3.25E+07	250	0.	3760	0.	
23	2.94E+07	271	1.94E+03	4065	0.	TOTALS
25	3.25E+07	291	3.89E+03	4370	0.	8.76E-04
27	2.86E+07	311	3.80E+03	4676	0.	176
IWC MED D	3.40E-03		2.60E-04		6.16E-04	202
	20		127			

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING

INTERVAL START: 18102130*

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)

TYPE: RULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (49)
2	2.37E+08	26	0.	437	1.35E+02	333.8
3	3.47E+08	47	2.79E+04	706	1.34E+01	ALT (KM)
5	2.84E+08	67	4.36E+03	1011	0.	8.336
7	2.06E+08	87	7.79E+03	1316	0.	TEMP (C)
9	1.57E+08	108	3.53E+03	1622	0.	-34.2
11	1.17E+08	128	2.62E+03	1927	0.	
12	8.66E+07	148	3.09E+03	2233	0.	FROSTPOINT
14	8.83E+07	169	0.	2538	0.	-32.9
16	9.19E+07	189	0.	2843	0.	
18	5.17E+07	209	0.	3149	0.	TAS (M/S)
19	4.30E+07	230	0.	3454	0.	122.0
21	2.78E+07	250	0.	3760	0.	
23	3.28E+07	271	2.29E+02	4065	0.	TOTALS
25	3.25E+07	291	4.58E+02	4370	0.	1.78E-04
27	2.78E+07	311	3.87E+02	4676	0.	219
IWC MED D	3.48E-03		7.73E-05		1.78E-04	105
	20		67			

AFML CIRRUS STUDY BY AFGL
 FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
 INTERVAL START:18:04:30*
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
 TYPE: BULL-ROSE

AFML CIRRUS STUDY BY AFGL
 FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
 INTERVAL START:18:03:30*
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
 TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	2.42E+08	26	0.	437	1.04E+02	333.1	2	3.66E+08	26	0.	437	6.71E-01	339.3
3	3.66E+08	47	0.	706	5.92E+00	8.331	3	3.66E+08	47	0.	706	1.08E+00	ALT (KM)
5	2.95E+08	67	0.	1011	0.	8.331	5	2.49E+08	67	0.	1011	0.	8.326
7	2.13E+08	87	0.	1316	0.	0.	7	1.74E+08	87	0.	1316	0.	TEMP (C)
9	1.57E+08	108	1.76E+03	1622	0.	-34.1	9	1.32E+08	108	0.	1622	0.	-34.0
11	1.20E+08	128	0.	1927	0.	FROSTPOINT	11	9.53E+07	128	0.	1927	0.	FROSTPOINT
12	8.79E+07	148	0.	2233	0.	-33.0	12	6.59E+07	148	0.	2233	0.	-32.9
14	9.24E+07	169	0.	2538	0.	TAS (M/S)	14	7.10E+07	169	0.	2538	0.	121.3
16	8.46E+07	189	0.	2843	0.	121.8	16	5.15E+07	189	0.	2843	0.	TOTALS
18	4.23E+07	209	0.	3149	0.	1.42E-04	18	2.74E+07	209	0.	3149	0.	5.69E-06
19	3.17E+07	230	0.	3454	0.	1.14E-04	19	2.21E+07	230	0.	3454	0.	301
21	2.42E+07	250	0.	3760	0.	1.42E-04	21	1.42E+07	250	0.	3760	0.	5.69E-06
23	2.56E+07	271	2.29E+02	4065	0.	1.42E-04	23	1.03E+07	271	0.	4065	0.	301
25	1.89E+07	291	4.57E+02	4370	0.	1.42E-04	25	1.09E+07	291	0.	4370	0.	5.69E-06
27	1.59E+07	311	3.73E+02	4676	0.	1.42E-04	27	7.26E+06	311	0.	4676	0.	301
TWC	2.79E-03	18	2.80E-05	126	1.14E-04	1.42E-04	TWC	1.81E-03	17	0.	0	5.69E-06	301
MED D					209	191	MED D						

INTERVAL START:18:04:00*
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
 TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	3.29E+08	26	0.	437	4.36E+00	339.3	2	5.52E+08	26	0.	437	0.	339.3
3	3.38E+08	47	1.88E+04	706	7.03E+00	ALT (KM)	3	3.00E+08	47	9.34E+03	706	0.	ALT (KM)
5	2.61E+08	67	0.	1011	0.	8.328	5	2.13E+08	67	0.	1011	0.	8.327
7	1.98E+08	87	0.	1316	0.	0.	7	1.37E+08	87	0.	1316	0.	TEMP (C)
9	1.39E+08	108	8.89E+03	1622	0.	-34.0	9	9.09E+07	108	0.	1622	0.	-34.0
11	1.08E+08	128	1.31E+03	1927	0.	FROSTPOINT	11	5.56E+07	128	0.	1927	0.	FROSTPOINT
12	7.57E+07	148	0.	2233	0.	-32.8	12	4.31E+07	148	1.04E+03	2233	0.	-33.1
14	8.60E+07	169	0.	2538	0.	TAS (M/S)	14	4.17E+07	169	0.	2538	0.	TAS (M/S)
16	6.98E+07	189	0.	2843	0.	121.3	16	3.75E+07	189	0.	2843	0.	121.1
18	3.41E+07	209	0.	3149	0.	1.14E-04	18	1.57E+07	209	0.	3149	0.	121.1
19	2.74E+07	230	0.	3454	0.	1.14E-04	19	1.20E+07	230	0.	3454	0.	121.1
21	2.32E+07	250	0.	3760	0.	1.14E-04	21	1.12E+07	250	0.	3760	0.	121.1
23	1.95E+07	271	0.	4065	0.	1.14E-04	23	5.32E+06	271	0.	4065	0.	121.1
25	2.15E+07	291	0.	4370	0.	1.14E-04	25	6.71E+06	291	0.	4370	0.	121.1
27	1.48E+07	311	0.	4676	0.	1.14E-04	27	4.75E+06	311	0.	4676	0.	121.1
TWC	2.50E-03	19	2.98E-05	57	3.70E-05	6.68E-05	TWC	1.15E-03	16	7.79E-06	0.	7.79E-06	68
MED D					301	238	MED D						68

AFWL CIRRUS STUDY BY AFGL

FLIGHT F78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL START*18:06:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (49)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (49)
2	5.67E+08	26	0.	437	7.50E+01	339.6	2	8.24E+08	26	0.	437	6.76E-01	339.3
3	2.92E+08	47	9.45E+03	706	5.43E-01		3	2.15E+08	47	0.	706	1.09E+00	
5	1.83E+08	67	0.	1011	0.		5	1.31E+08	57	0.	1011	0.	8.327
7	1.41E+08	87	0.	1316	0.	8.321	7	8.84E+07	87	0.	1316	0.	
9	9.65E+07	108	0.	1622	0.		9	5.56E+07	108	0.	1622	0.	TEMP (C)
11	6.71E+07	128	0.	1927	0.	-33.6	11	4.39E+07	128	0.	1927	0.	-33.6
12	4.74E+07	148	0.	2233	0.		12	2.53E+07	148	0.	2233	0.	
14	3.44E+07	169	0.	2538	0.		14	2.59E+07	169	0.	2538	0.	FROSTPOINT
15	4.03E+07	189	0.	2843	0.	-33.1	15	1.86E+07	189	0.	2843	0.	-33.2
18	2.26E+07	209	0.	3149	0.		18	9.29E+06	209	0.	3149	0.	TAS (M/S)
19	1.50E+07	230	0.	3454	0.		19	6.48E+06	230	0.	3454	0.	
21	9.31E+06	250	0.	3760	0.	120.1	21	4.22E+06	250	0.	3760	0.	120.3
23	5.93E+06	271	3.11E+02	4065	0.		23	3.66E+06	271	0.	4065	0.	
25	3.95E+06	291	6.21E+02	4370	0.		25	3.94E+06	291	0.	4370	0.	
27	1.98E+06	311	4.64E+02	4676	0.		27	2.25E+06	311	0.	4676	0.	
TOTALS				TOTALS			TOTALS				TOTALS		TOTALS
1.11E-03	16	3.53E-05	128	5.71E-05	194	9.45E-05	16	6.57E-04	16	0.	5.74E-06	301	5.74E-06
1.11E-03	16	3.53E-05	128	5.71E-05	194	9.45E-05	16	6.57E-04	16	0.	5.74E-06	301	5.74E-06
TOTALS				TOTALS			TOTALS				TOTALS		TOTALS
1.11E-03	16	3.53E-05	128	5.71E-05	194	9.45E-05	16	6.57E-04	16	0.	5.74E-06	301	5.74E-06
1.11E-03	16	3.53E-05	128	5.71E-05	194	9.45E-05	16	6.57E-04	16	0.	5.74E-06	301	5.74E-06

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INTERVAL START:19:06:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MH)
TYPE: BULL-ROSE
INTERVAL START:18:07:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MH)
TYPE: BULL-ROSE
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INTERVAL START: 16:07:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (43)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (43)
2	5.67E+08	26	0.	437	7.50E+01	339.6	2	8.24E+08	26	0.	437	6.76E-01	339.3
3	2.92E+08	47	9.45E+03	706	5.43E-01		3	2.15E+08	47	0.	706	1.09E+00	
5	1.83E+08	67	0.	1011	0.		5	1.31E+08	57	0.	1011	0.	8.327
7	1.41E+08	87	0.	1316	0.	8.321	7	8.84E+07	87	0.	1316	0.	
9	9.65E+07	108	0.	1622	0.		9	5.56E+07	108	0.	1622	0.	TEMP (C)
11	6.71E+07	128	0.	1927	0.	-33.6	11	4.39E+07	128	0.	1927	0.	-33.6
12	4.74E+07	148	0.	2233	0.		12	2.53E+07	148	0.	2233	0.	
14	3.44E+07	169	0.	2538	0.		14	2.59E+07	169	0.	2538	0.	FROSTPOINT
16	4.03E+07	189	0.	2843	0.	-33.1	16	1.86E+07	189	0.	2843	0.	-33.2
18	2.26E+07	209	0.	3149	0.		18	9.29E+06	209	0.	3149	0.	TAS (M/S)
19	1.50E+07	230	0.	3454	0.		19	6.48E+06	230	0.	3454	0.	
21	9.31E+06	250	0.	3760	0.	120.1	21	4.22E+06	250	0.	3760	0.	120.3
23	5.93E+06	271	3.11E+02	4065	0.		23	3.66E+06	271	0.	4065	0.	
25	3.95E+06	291	6.21E+02	4370	0.		25	3.94E+06	291	0.	4370	0.	
27	1.98E+06	311	4.64E+02	4676	0.		27	2.25E+06	311	0.	4676	0.	
TOTALS				TOTALS			TOTALS				TOTALS		TOTALS
1.11E-03	16	3.53E-05	128	5.71E-05	194	9.45E-05	16	6.57E-04	16	0.	5.74E-06	301	5.74E-06
TOTALS				TOTALS			TOTALS				TOTALS		TOTALS
1.11E-03	16	3.53E-05	128	5.71E-05	194	9.45E-05	16	6.57E-04	16	0.	5.74E-06	301	5.74E-06
TOTALS				TOTALS			TOTALS				TOTALS		TOTALS

AFWL CIRRHUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
 INTERVAL START:18107330*
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
 TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	7.64E+08	26	0.	0.	339.4
3	2.17E+08	47	0.	0.	ALT (KM)
5	1.43E+08	67	0.	0.	8.324
7	9.60E+07	87	0.	0.	1316
9	6.70E+07	108	0.	0.	1622
11	4.56E+07	128	0.	0.	1927
12	3.55E+07	148	0.	0.	2233
14	2.79E+07	169	0.	0.	2538
16	2.14E+07	189	0.	0.	2843
18	1.07E+07	209	0.	0.	3149
19	8.73E+06	230	0.	0.	3454
21	4.22E+06	250	0.	0.	3760
23	5.63E+06	271	0.	0.	4065
25	3.10E+06	291	0.	0.	4370
27	3.94E+06	311	0.	0.	4676
IMC	7.76E-04	0.	0.	0.	TOTALS
MED D	16	0.	0.	0.	0.

AFWL CIRRHUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
 INTERVAL START:18108830*
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
 TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	3.18E+08	26	0.	0.	339.3
3	3.75E+08	47	0.	0.	ALT (KM)
5	2.84E+08	67	0.	0.	8.328
7	2.08E+08	87	0.	0.	1316
9	1.51E+08	108	0.	0.	1622
11	1.14E+08	128	0.	0.	1927
12	8.79E+07	148	0.	0.	2233
14	7.47E+07	169	0.	0.	2538
16	7.20E+07	189	0.	0.	2843
18	3.50E+07	209	0.	0.	3149
19	2.56E+07	230	0.	0.	3454
21	2.07E+07	250	0.	0.	3760
23	1.65E+07	271	0.	0.	4065
25	1.15E+07	291	0.	0.	4370
27	1.04E+07	311	0.	0.	4676
IMC	2.23E-03	0.	0.	0.	TOTALS
MED D	17	0.	0.	0.	0.

INTERVAL START:18108100*
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
 TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	5.09E+08	26	0.	2.70E+00	333.3
3	2.88E+08	47	0.	4.35E+00	ALT (KM)
5	1.78E+08	67	0.	0.	8.326
7	1.43E+08	87	0.	0.	1316
9	8.81E+07	108	0.	0.	1622
11	7.26E+07	128	0.	0.	1927
12	3.74E+07	148	0.	0.	2233
14	4.62E+07	169	0.	0.	2538
16	3.18E+07	189	0.	0.	2843
18	1.13E+07	209	0.	0.	3149
19	1.29E+07	230	0.	0.	3454
21	8.45E+06	250	0.	0.	3760
23	6.19E+06	271	0.	0.	4065
25	6.19E+06	291	0.	0.	4370
27	2.25E+06	311	0.	0.	4676
IMC	1.05E-03	0.	0.	2.29E-05	TOTALS
MED D	16	0.	0.	301	2.29E-05

INTERVAL START:18109100*
 PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
 TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	4.44E+08	26	0.	3.36E-01	339.2
3	3.13E+08	47	0.	5.42E-01	ALT (KM)
5	2.32E+08	67	0.	0.	8.328
7	1.67E+08	87	0.	0.	1316
9	1.12E+08	108	0.	0.	1622
11	8.24E+07	128	0.	0.	1927
12	6.01E+07	148	0.	0.	2233
14	5.72E+07	169	0.	0.	2538
16	5.33E+07	189	0.	0.	2843
18	2.68E+07	209	0.	0.	3149
19	1.51E+07	230	0.	0.	3454
21	1.51E+07	250	0.	0.	3760
23	1.29E+07	271	0.	0.	4065
25	1.09E+07	291	0.	0.	4370
27	9.22E+06	311	0.	0.	4676
IMC	1.71E-03	0.	0.	2.05E-06	TOTALS
MED D	17	0.	0.	301	2.05E-06

AFWL CIRRUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS*18:09:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	5.69E+00	26	0.	437	8.17E+01	339.3
3	2.72E+00	47	0.	706	1.63E+00	ALT (KM)
5	1.80E+00	67	0.	1011	0.	8.326
7	1.27E+00	87	0.	1316	0.	ALT (KM)
9	9.38E+07	108	0.	1622	0.	TEMP (C)
11	6.43E+07	128	0.	1927	0.	-33.9
12	4.47E+07	148	0.	2233	0.	FROSTPOINT
14	4.52E+07	169	0.	2538	0.	-33.7
16	3.34E+07	189	0.	2843	0.	TAS (M/S)
18	1.83E+07	209	0.	3149	0.	120.6
19	1.15E+07	230	0.	3454	0.	TOTALS
21	9.27E+06	250	0.	3760	0.	7.18E-05
23	1.04E+07	271	0.	4065	0.	130
25	7.02E+06	291	0.	4370	0.	2.75E-05
27	7.02E+06	311	0.	4676	0.	17
IMC	1.24E-03					1.24E-03
MED D						130

AFWL CIRRUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS*18:10:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	3.76E+00	26	1.07E+05	437	6.24E+01	338.0
3	3.15E+00	47	9.35E+03	706	1.01E+02	ALT (KM)
5	2.35E+00	67	0.	1011	5.69E-01	0.337
7	1.50E+00	87	0.	1316	0.	TEMP (C)
9	1.14E+00	108	0.	1622	0.	-33.9
11	8.24E+07	128	0.	1927	0.	FROSTPOINT
12	6.76E+07	148	1.03E+03	2233	0.	-33.7
14	6.20E+07	169	0.	2538	0.	TAS (M/S)
16	6.03E+07	189	0.	2843	0.	121.3
18	3.30E+07	209	0.	3149	0.	TOTALS
19	2.30E+07	230	0.	3454	0.	5.37E-04
21	1.82E+07	250	0.	3760	0.	302
23	1.93E+07	271	0.	4065	0.	2.14E-05
25	1.73E+07	291	0.	4370	0.	25
27	1.76E+07	311	0.	4676	0.	2.14E-05
IMC	2.22E-03					2.14E-05
MED D						25

INTERVAL STARTS*18:10:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	4.47E+00	26	0.	437	3.30E+01	339.3
3	3.16E+00	47	9.39E+03	706	5.32E+01	ALT (KM)
5	2.09E+00	67	0.	1011	1.71E+00	8.326
7	1.63E+00	87	0.	1316	0.	ALT (KM)
9	1.14E+00	108	3.57E+03	1622	0.	TEMP (C)
11	8.32E+07	128	0.	1927	0.	-33.7
12	6.25E+07	148	0.	2233	0.	FROSTPOINT
14	5.13E+07	169	0.	2538	0.	-33.8
16	4.65E+07	189	0.	2843	0.	TAS (M/S)
18	2.24E+07	209	0.	3149	0.	120.9
19	1.96E+07	230	0.	3454	0.	TOTALS
21	1.46E+07	250	0.	3760	0.	3.04E-04
23	1.43E+07	271	0.	4065	0.	308
25	1.60E+07	291	0.	4370	0.	1.12E-05
27	7.85E+06	311	0.	4676	0.	56
IMC	1.74E-03					1.12E-05
MED D						56

INTERVAL STARTS*18:11:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	4.47E+00	26	0.	437	1.54E+01	338.9
3	3.34E+00	47	0.	706	2.49E+01	ALT (KM)
5	2.37E+00	67	0.	1011	1.70E+00	8.336
7	1.53E+00	87	0.	1316	0.	TEMP (C)
9	1.23E+00	108	1.77E+03	1622	0.	-33.7
11	8.31E+07	128	0.	1927	0.	FROSTPOINT
12	5.65E+07	148	0.	2233	0.	-33.5
14	5.70E+07	169	0.	2538	0.	TAS (M/S)
16	4.36E+07	189	0.	2843	0.	121.2
18	2.18E+07	209	0.	3149	0.	TOTALS
19	1.57E+07	230	0.	3454	0.	1.55E-04
21	1.20E+07	250	0.	3760	0.	315
23	1.31E+07	271	0.	4065	0.	2.14E-05
25	8.66E+06	291	0.	4370	0.	58
27	6.15E+06	311	0.	4676	0.	3.69E-06
IMC	1.52E-03					3.69E-06
MED D						58

AFML CIRRHUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS:10:11:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	3.25E+00	26	0.	9.61E+01	339.3
3	3.56E+00	47	3.74E+04	1.55E+02	ALT (KM)
5	2.47E+00	67	0.	1.13E+01	8.328
7	1.97E+00	87	0.	2.39E+00	TEMP (C)
9	1.33E+00	108	0.	0.	-33.7
11	1.12E+00	128	0.	1927	0.
12	7.31E+07	148	0.	2233	0.
14	7.56E+07	169	0.	2538	0.
16	6.38E+07	189	0.	2843	0.
18	3.51E+07	209	0.	3149	0.
19	2.93E+07	230	1.10E+03	3454	0.
21	1.84E+07	250	0.	3760	0.
23	2.12E+07	271	0.	4065	0.
25	1.73E+07	291	0.	4370	0.
27	1.42E+07	311	0.	4676	0.
IMC	2.37E-03	IMC	2.69E-05	1.05E-03	TOTALS
MED D	18	MED D	37	322	1.07E-03
					320

AFML CIRRHUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS:10:12:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	4.61E+00	26	2.12E+05	3.87E+02	339.3
3	2.88E+00	47	2.79E+04	6.25E+02	ALT (KM)
5	2.09E+00	67	0.	1011	8.327
7	1.53E+00	87	7.79E+03	7.14E+00	TEMP (C)
9	9.47E+07	108	1.77E+04	1.26E+00	-33.8
11	8.50E+07	128	2.62E+03	1927	0.
12	5.08E+07	148	2.05E+03	2233	0.
14	5.86E+07	169	8.50E+02	2538	0.
16	5.11E+07	189	1.83E+03	2843	0.
18	2.75E+07	209	9.98E+02	3149	0.
19	2.64E+07	230	0.	3454	0.
21	1.58E+07	250	0.	3760	0.
23	1.66E+07	271	0.	4065	0.
25	1.36E+07	291	0.	4370	0.
27	1.39E+07	311	0.	4676	0.
IMC	1.95E-03	IMC	1.26E-04	4.28E-03	TOTALS
MED D	19	MED D	57	324	4.40E-03
					321

72

INTERVAL STARTS:10:12:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	3.88E+00	26	1.41E+05	9.89E+02	338.7
3	3.15E+00	47	4.65E+04	2.25E+02	ALT (KM)
5	2.43E+00	67	4.35E+03	2.03E+01	8.339
7	1.71E+00	87	5.20E+03	2.37E+00	TEMP (C)
9	1.27E+00	108	1.41E+04	0.	-33.9
11	9.37E+07	128	2.62E+03	1927	0.
12	8.89E+07	148	3.89E+03	2233	0.
14	6.81E+07	169	8.50E+02	2538	0.
16	6.53E+07	189	9.19E+02	2843	0.
18	3.67E+07	209	0.	3149	0.
19	3.39E+07	230	0.	3454	0.
21	2.09E+07	250	1.22E+03	3760	0.
23	2.09E+07	271	1.65E+03	4065	0.
25	2.61E+07	291	2.21E+03	4370	0.
27	2.14E+07	311	1.97E+03	4676	0.
IMC	2.66E-03	IMC	2.56E-04	2.27E-03	TOTALS
MED D	20	MED D	115	278	2.52E-03
					262

INTERVAL STARTS:10:13:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	4.49E+00	26	0.	1.58E+02	339.2
3	3.19E+00	47	1.86E+04	2.55E+02	ALT (KM)
5	2.30E+00	67	4.37E+03	2.26E+01	8.330
7	1.69E+00	87	0.	1.78E+00	TEMP (C)
9	1.14E+00	108	7.07E+03	1622	-33.9
11	7.86E+07	128	0.	1927	0.
12	5.72E+07	148	1.03E+03	2233	0.
14	5.89E+07	169	8.51E+02	2538	0.
16	4.55E+07	189	0.	2843	0.
18	3.03E+07	209	9.98E+02	3149	0.
19	1.69E+07	230	1.10E+03	3454	0.
21	1.83E+07	250	0.	3760	0.
23	1.33E+07	271	0.	4065	0.
25	1.36E+07	291	0.	4370	0.
27	1.39E+07	311	0.	4676	0.
IMC	1.88E-03	IMC	5.44E-05	1.71E-03	TOTALS
MED D	18	MED D	71	322	1.77E-03
					319

AFWL CIRRUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL START: 1013:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M*3-MM)
TYPE: BULL-ROSE

[illegible]

73

INTERVAL START: 10:14:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/
TYPE: BULL-ROSE

[illegible]

UNIT
MED D

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS:18:15:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	3.99E+08	26	7.06E+04	9.38E+02	339.3
3	3.39E+08	47	1.89E+04	1.38E+02	ALT (KM)
5	2.58E+08	67	0.	9.03E+00	0.327
7	1.78E+08	87	2.59E+03	5.94E-01	TEMP (C)
9	1.22E+08	108	5.30E+03	0.	-33.9
11	1.09E+08	128	5.23E+03	0.	FROSTPOINT
12	8.06E+07	148	2.06E+03	0.	-34.0
14	7.65E+07	169	0.	0.	2843
16	7.64E+07	189	9.17E+02	0.	3149
18	4.29E+07	209	0.	0.	3454
19	3.00E+07	230	0.	0.	3760
21	2.69E+07	250	0.	0.	4065
23	2.67E+07	271	1.33E+03	0.	4370
25	2.72E+07	291	2.68E+03	0.	4676
27	2.50E+07	311	2.30E+03	0.	TOTALS
IMC	2.95E-03	20	2.05E-04	1.59E-03	1.80E-03
MED D			125	242	229

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS:18:16:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	3.10E+08	26	0.	4.97E+02	339.2
3	3.27E+08	47	9.27E+03	5.79E+01	ALT (KM)
5	2.78E+08	67	4.35E+03	1.13E+00	0.330
7	2.05E+08	87	0.	0.	TEMP (C)
9	1.52E+08	108	0.	0.	-34.0
11	1.29E+08	128	1.30E+03	0.	FROSTPOINT
12	9.03E+07	148	0.	0.	-34.6
14	1.17E+08	169	0.	0.	2843
16	1.01E+08	189	9.15E+02	0.	3149
18	6.04E+07	209	0.	0.	3454
19	5.63E+07	230	0.	0.	3760
21	4.18E+07	250	0.	0.	4065
23	4.13E+07	271	7.94E+02	0.	4370
25	4.35E+07	291	1.59E+03	0.	4676
27	3.44E+07	311	1.35E+03	0.	TOTALS
IMC	4.29E-03	21	1.03E-04	7.13E-04	8.16E-04
MED D			128	226	214

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS:18:16:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	3.82E+08	26	0.	1.37E+01	339.1
3	3.10E+08	47	1.87E+04	2.21E+01	ALT (KM)
5	2.46E+08	67	0.	5.67E-01	0.330
7	1.99E+08	87	0.	0.	TEMP (C)
9	1.52E+08	108	0.	0.	-33.9
11	1.32E+08	128	0.	0.	FROSTPOINT
12	9.86E+07	148	1.03E+03	0.	-34.1
14	1.13E+08	169	0.	0.	2843
16	9.84E+07	189	0.	0.	3149
18	5.63E+07	209	0.	0.	3454
19	5.35E+07	230	0.	0.	3760
21	3.79E+07	250	0.	0.	4065
23	4.01E+07	271	0.	0.	4370
25	3.18E+07	291	0.	0.	4676
27	2.81E+07	311	0.	0.	TOTALS
IMC	3.89E-03	20	1.15E-05	1.24E-04	1.35E-04
MED D			36	306	299

INTERVAL STARTS:18:17:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	5.89E+08	26	3.52E+04	2.46E+02	339.2
3	3.32E+08	47	2.78E+04	7.73E+01	ALT (KM)
5	2.46E+08	67	0.	1.69E+00	0.330
7	1.64E+08	87	0.	0.	TEMP (C)
9	1.31E+08	108	5.29E+03	0.	-33.9
11	9.54E+07	128	0.	0.	FROSTPOINT
12	6.21E+07	148	0.	0.	-34.8
14	7.32E+07	169	8.47E+02	0.	2843
16	6.71E+07	189	9.14E+02	0.	3149
18	2.86E+07	209	0.	0.	3454
19	2.99E+07	230	0.	0.	3760
21	1.83E+07	250	0.	0.	4065
23	2.36E+07	271	2.29E+02	0.	4370
25	1.50E+07	291	4.57E+02	0.	4676
27	1.55E+07	311	4.20E+02	0.	TOTALS
IMC	2.30E-03	19	6.23E-05	5.99E-04	6.61E-04
MED D			81	275	263

AFML CIRRUS STUDY BY AFGL

FLIGHT 578-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS:18:17:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MM)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MM)
2	4.85E+00	26	3.53E+04	437	1.39E+02	339.1	2	3.86E+08	26	0.	437	6.93E+00	339.7
3	3.49E+00	47	3.72E+04	706	2.24E+02	ALT (KM)	3	3.64E+08	47	9.21E+03	706	1.12E+01	ALT (KM)
5	2.35E+00	67	4.37E+03	1011	1.98E+01	8.331	5	2.54E+08	67	4.32E+03	1011	0.	8.339
7	1.82E+00	87	2.60E+03	1316	1.78E+00	TEMP (C)	7	1.91E+08	87	0.	1316	0.	TEMP (C)
9	1.20E+00	108	1.06E+04	1622	0.	-33.9	9	1.36E+08	108	5.24E+03	1622	0.	-36.2
11	1.01E+00	128	0.	1927	0.	FROSTPOINT	11	9.19E+07	128	0.	1927	0.	FROSTPOINT
12	6.75E+07	148	1.03E+03	2233	0.	-34.6	12	7.62E+07	148	0.	2233	0.	-33.4
14	7.80E+07	169	0.	2538	0.	TAS (M/S)	14	8.61E+07	169	0.	2538	0.	TAS (M/S)
16	6.36E+07	189	0.	2843	0.	122.0	16	6.66E+07	189	0.	2843	0.	123.1
18	3.75E+07	209	2.00E+03	3149	0.	TOTALS	18	3.41E+07	209	0.	3149	0.	TOTALS
19	3.28E+07	230	0.	3454	0.	1.51E-03	19	3.14E+07	230	1.09E+03	3454	0.	8.89E-05
21	2.22E+07	250	0.	3760	0.	322	21	2.50E+07	250	0.	3760	0.	301
23	2.19E+07	271	0.	4065	0.	57	23	2.37E+07	271	0.	4065	0.	59
25	1.86E+07	291	0.	4370	0.	19	25	2.45E+07	291	0.	4370	0.	19
27	1.11E+07	311	0.	4676	0.	319	27	1.57E+07	311	0.	4676	0.	319
IMC MED 0	2.38E-03		6.91E-05		1.51E-03		IMC MED 0	2.63E-03		3.00E-05		5.88E-05	

AFML CIRRUS STUDY BY AFGL

FLIGHT 578-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS:18:18:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MM)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MM)
2	4.85E+00	26	3.53E+04	437	1.39E+02	339.1	2	3.86E+08	26	0.	437	6.93E+00	339.7
3	3.49E+00	47	3.72E+04	706	2.24E+02	ALT (KM)	3	3.64E+08	47	9.21E+03	706	1.12E+01	ALT (KM)
5	2.35E+00	67	4.37E+03	1011	1.98E+01	8.331	5	2.54E+08	67	4.32E+03	1011	0.	8.339
7	1.82E+00	87	2.60E+03	1316	1.78E+00	TEMP (C)	7	1.91E+08	87	0.	1316	0.	TEMP (C)
9	1.20E+00	108	1.06E+04	1622	0.	-33.9	9	1.36E+08	108	5.24E+03	1622	0.	-36.2
11	1.01E+00	128	0.	1927	0.	FROSTPOINT	11	9.19E+07	128	0.	1927	0.	FROSTPOINT
12	6.75E+07	148	1.03E+03	2233	0.	-34.6	12	7.62E+07	148	0.	2233	0.	-33.4
14	7.80E+07	169	0.	2538	0.	TAS (M/S)	14	8.61E+07	169	0.	2538	0.	TAS (M/S)
16	6.36E+07	189	0.	2843	0.	122.0	16	6.66E+07	189	0.	2843	0.	123.1
18	3.75E+07	209	2.00E+03	3149	0.	TOTALS	18	3.41E+07	209	0.	3149	0.	TOTALS
19	3.28E+07	230	0.	3454	0.	1.51E-03	19	3.14E+07	230	1.09E+03	3454	0.	8.89E-05
21	2.22E+07	250	0.	3760	0.	322	21	2.50E+07	250	0.	3760	0.	301
23	2.19E+07	271	0.	4065	0.	57	23	2.37E+07	271	0.	4065	0.	59
25	1.86E+07	291	0.	4370	0.	19	25	2.45E+07	291	0.	4370	0.	19
27	1.11E+07	311	0.	4676	0.	319	27	1.57E+07	311	0.	4676	0.	319
IMC MED 0	2.38E-03		6.91E-05		1.51E-03		IMC MED 0	2.63E-03		3.00E-05		5.88E-05	

INTERVAL STARTS:18:18:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MM)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MM)
2	4.46E+00	26	0.	437	4.25E+02	339.3	2	3.43E+08	26	1.05E+05	437	5.22E+02	339.7
3	3.43E+00	47	9.24E+03	706	3.10E+01	ALT (KM)	3	3.67E+08	47	1.19E+05	706	8.43E+02	ALT (KM)
5	2.67E+00	67	0.	1011	2.61E+00	8.335	5	2.60E+08	67	1.29E+04	1011	7.20E+01	8.339
7	1.70E+00	87	0.	1316	0.	TEMP (C)	7	1.82E+08	87	5.13E+03	1316	9.40E+00	TEMP (C)
9	1.30E+00	108	0.	1622	0.	-34.1	9	1.32E+08	108	2.44E+04	1622	2.48E+00	-36.1
11	8.75E+07	128	0.	1927	0.	FROSTPOINT	11	1.09E+08	128	5.17E+03	1927	0.	FROSTPOINT
12	6.71E+07	148	0.	2233	0.	-34.2	12	7.16E+07	148	5.09E+03	2233	0.	-33.5
14	7.67E+07	169	0.	2538	0.	TAS (M/S)	14	7.71E+07	169	9.08E+02	2538	0.	TAS (M/S)
16	6.63E+07	189	0.	2843	0.	122.7	16	6.69E+07	189	0.	2843	0.	123.5
18	3.45E+07	209	9.97E+02	3149	0.	TOTALS	18	4.31E+07	209	0.	3149	0.	TOTALS
19	2.98E+07	230	0.	3454	0.	5.47E-04	19	3.54E+07	230	2.18E+03	3454	0.	6.09E-03
21	1.99E+07	250	0.	3760	0.	217	21	2.66E+07	250	2.42E+03	3760	0.	325
23	1.68E+07	271	8.69E+02	4065	0.		23	2.91E+07	271	0.	4065	0.	
25	1.68E+07	291	1.74E+03	4370	0.		25	2.88E+07	291	0.	4370	0.	
27	1.13E+07	311	1.43E+03	4676	0.		27	2.53E+07	311	0.	4676	0.	
IMC MED 0	2.24E-03		1.05E-04		5.47E-04		IMC MED 0	3.02E-03		2.26E-04		5.87E-03	

AFWL CIRRUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS: 18:19:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: GULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (49)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (49)
2	3.57E+08	26	3.83E+05	2.89E+03	333.9	2	4.54E+08	26	4.17E+05	4.86E+03	339.8
3	3.34E+08	47	2.01E+05	1.37E+03		3	3.06E+08	47	2.56E+05	6.56E+02	
5	2.53E+08	67	1.72E+04	1.26E+02	8.337	5	2.16E+08	67	2.57E+04	2.11E+01	8.337
7	1.76E+08	87	2.81E+04	1.58E+01		7	1.66E+08	87	1.28E+04	1316	5.07E-01
9	1.39E+08	108	2.61E+04	1.85E+00		9	1.16E+08	108	4.00E+04	1622	6.19E-01
11	1.08E+08	128	1.42E+04	1.96E+00	-34.0	11	9.42E+07	128	2.06E+04	1927	0.
12	8.51E+07	148	6.08E+03	2.78E+00		12	6.21E+07	148	9.12E+03	2233	0.
14	9.47E+07	169	1.68E+03	0.		14	7.03E+07	169	4.18E+03	2538	0.
16	7.39E+07	189	3.61E+03	0.	-33.4	16	6.54E+07	189	8.11E+03	2843	0.
18	3.97E+07	209	9.83E+02	0.		18	3.80E+07	209	6.89E+03	3149	0.
19	3.77E+07	230	2.17E+03	0.		19	3.15E+07	230	6.47E+03	3454	0.
21	2.93E+07	250	0.	0.	TAS (M/S)	21	2.11E+07	250	4.79E+03	3760	0.
23	2.60E+07	271	2.17E+03	0.	123.9	23	2.63E+07	271	8.33E+03	4065	0.
25	2.63E+07	291	4.34E+03	0.		25	2.27E+07	291	1.45E+04	4370	0.
27	2.76E+07	311	4.11E+03	0.		27	2.41E+07	311	1.24E+04	4676	0.
IMC	3.08E-03		6.11E-04	1.19E-02	TOTALS	IMC	2.87E-03		1.45E-03	7.61E-03	TOTALS
MED D	20		78	314	1.25E-02	MED D	20		119	233	9.06E-03
					307						216

AFWL CIRRUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS: 18:20:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: GULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (49)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (49)
2	4.54E+08	26	4.17E+05	4.86E+03	339.8	2	4.34E+08	26	4.84E+05	7.22E+03	339.7
3	3.06E+08	47	2.56E+05	6.56E+02		3	3.02E+08	47	3.64E+05	3.67E+02	
5	2.16E+08	67	2.57E+04	2.11E+01	8.337	5	2.28E+08	67	2.99E+04	1.05E+01	8.339
7	1.66E+08	87	1.28E+04	1316	5.07E-01	7	1.68E+08	87	2.29E+04	0.	
9	1.16E+08	108	4.00E+04	1622	6.19E-01	9	1.11E+08	108	3.81E+04	1622	0.
11	9.42E+07	128	2.06E+04	1927	0.	11	9.84E+07	128	8.97E+03	1927	0.
12	6.21E+07	148	9.12E+03	2233	0.	12	6.92E+07	148	1.01E+04	2233	0.
14	7.03E+07	169	4.18E+03	2538	0.	14	6.95E+07	169	5.82E+03	2538	0.
16	6.54E+07	189	8.11E+03	2843	0.	16	5.99E+07	189	2.34E+04	2843	0.
18	3.80E+07	209	6.89E+03	3149	0.	18	3.27E+07	209	2.16E+04	3149	0.
19	3.15E+07	230	6.47E+03	3454	0.	19	3.03E+07	230	4.42E+04	3454	0.
21	2.11E+07	250	4.79E+03	3760	0.	21	2.07E+07	250	2.87E+04	3760	0.
23	2.63E+07	271	8.33E+03	4065	0.	23	2.48E+07	271	3.24E+04	4065	0.
25	2.27E+07	291	1.45E+04	4370	0.	25	2.23E+07	291	3.65E+04	4370	0.
27	2.41E+07	311	1.24E+04	4676	0.	27	1.96E+07	311	2.92E+04	4676	0.
IMC	2.87E-03		1.45E-03	7.61E-03	TOTALS	IMC	2.51E-03		3.83E-03	8.04E-03	TOTALS
MED D	20		119	233	9.06E-03	MED D	20		118	207	1.19E-02
					216						175

INTERVAL STARTS: 18:20:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: GULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (49)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (49)
2	4.34E+08	26	3.14E+05	4.61E+03	338.9	2	4.31E+08	26	4.84E+05	7.22E+03	339.7
3	3.20E+08	47	2.57E+05	1.06E+03		3	3.02E+08	47	3.64E+05	3.67E+02	
5	2.28E+08	67	3.01E+04	7.36E+01	8.335	5	2.28E+08	67	2.99E+04	1.05E+01	8.339
7	1.61E+08	87	2.31E+04	3.52E+00		7	1.68E+08	87	2.29E+04	0.	
9	1.30E+08	108	3.31E+04	0.		9	1.11E+08	108	3.81E+04	1622	0.
11	9.92E+07	128	1.03E+04	0.	-33.9	11	9.84E+07	128	8.97E+03	1927	0.
12	6.96E+07	148	4.07E+03	0.		12	6.92E+07	148	1.01E+04	2233	0.
14	8.14E+07	169	2.52E+03	0.		14	6.95E+07	169	5.82E+03	2538	0.
16	5.67E+07	189	2.71E+03	0.	-33.1	16	5.99E+07	189	2.34E+04	2843	0.
18	3.67E+07	209	1.97E+03	0.		18	3.27E+07	209	2.16E+04	3149	0.
19	2.71E+07	230	2.17E+03	0.		19	3.03E+07	230	4.42E+04	3454	0.
21	2.47E+07	250	1.21E+03	0.	TAS (M/S)	21	2.07E+07	250	2.87E+04	3760	0.
23	2.69E+07	271	3.52E+03	0.	123.6	23	2.48E+07	271	3.24E+04	4065	0.
25	2.28E+07	291	1.03E+04	0.		25	2.23E+07	291	3.65E+04	4370	0.
27	1.89E+07	311	9.18E+03	0.		27	1.96E+07	311	2.92E+04	4676	0.
IMC	2.61E-03		9.40E-04	1.01E-02	TOTALS	IMC	2.51E-03		3.83E-03	8.04E-03	TOTALS
MED D	20		123	271	1.10E-02	MED D	20		118	207	1.19E-02
					259						175

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS*18122130*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (49)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (49)
2	3.80E+00	26	4.14E+05	437	3.66E+03	338.9	2	4.73E+00	26	3.13E+05	437	4.04E+03	338.5
3	3.25E+00	47	1.27E+05	706	2.29E+02		3	3.17E+00	47	2.11E+05	706	1.27E+02	
5	2.33E+00	67	1.70E+04	1011	9.92E+00	8.335	5	2.20E+00	67	1.72E+04	1011	1.67E+00	8.343
7	1.71E+00	87	2.28E+04	1316	5.61E-01		7	1.68E+00	87	2.30E+04	1316	0.	
9	1.35E+00	108	3.10E+04	1622	0.	TEMP (C)	9	1.12E+00	108	3.66E+04	1622	0.	TEMP (C)
11	9.49E+07	128	3.84E+03	1927	0.	-34.2	11	9.20E+07	128	1.42E+04	1927	0.	-34.1
12	6.48E+07	148	6.04E+03	2233	0.		12	6.68E+07	148	1.01E+04	2233	0.	
14	7.46E+07	169	4.14E+03	2538	0.	FROSTPOINT	14	6.46E+07	169	1.60E+03	2538	0.	FROSTPOINT
16	6.86E+07	189	7.17E+03	2843	0.	-34.8	16	5.80E+07	189	6.33E+03	2843	0.	-34.1
18	4.45E+07	209	1.17E+04	3149	0.		18	3.42E+07	209	8.86E+03	3149	0.	
19	3.09E+07	230	4.30E+03	3454	0.	TAS (M/S)	19	2.79E+07	230	1.52E+04	3454	0.	TAS (M/S)
21	2.82E+07	250	1.19E+04	3760	0.	124.3	21	2.25E+07	250	2.05E+04	3760	0.	123.9
23	2.47E+07	271	1.40E+04	4065	0.		23	2.41E+07	271	2.33E+04	4065	0.	
25	2.71E+07	291	1.65E+04	4370	0.		25	2.44E+07	291	2.65E+04	4370	0.	
27	2.60E+07	311	1.34E+04	4676	0.		27	2.16E+07	311	2.04E+04	4676	0.	
IWC MED D	2.80E-03 20		1.61E-03 120		4.37E-03 211	TOTALS 185	IWC MED D	2.54E-03 20		2.46E-03 121		4.07E-03 200	TOTALS 154

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS*18122130*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

INTERVAL STARTS*18122100*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (49)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (49)
2	4.59E+00	26	7.28E+05	437	6.90E+03	338.3	2	5.09E+00	26	3.12E+05	437	3.54E+03	339.6
3	2.94E+00	47	4.92E+05	706	2.89E+02		3	3.04E+00	47	2.37E+05	706	9.82E+01	
5	2.12E+00	67	1.28E+04	1011	8.32E+00	8.336	5	2.10E+00	67	1.28E+04	1011	1.66E+00	8.341
7	1.61E+00	87	1.53E+04	1316	0.		7	1.49E+00	87	1.28E+04	1316	0.	
9	1.22E+00	108	3.61E+04	1622	0.	TEMP (C)	9	1.06E+00	108	3.12E+04	1622	0.	TEMP (C)
11	9.82E+07	128	2.31E+04	1927	0.	-34.2	11	7.20E+07	128	7.78E+03	1927	0.	-34.0
12	6.82E+07	148	2.12E+04	2233	0.		12	5.61E+07	148	5.05E+03	2233	0.	
14	6.66E+07	169	1.50E+04	2538	0.	FROSTPOINT	14	6.19E+07	169	2.50E+03	2538	0.	FROSTPOINT
16	6.41E+07	189	4.31E+04	2843	0.	-34.9	16	4.80E+07	189	3.60E+03	2843	0.	-34.4
18	4.04E+07	209	4.80E+04	3149	0.		18	3.57E+07	209	4.90E+03	3149	0.	
19	2.92E+07	230	4.96E+04	3454	0.	TAS (M/S)	19	1.83E+07	230	4.31E+03	3454	0.	TAS (M/S)
21	2.67E+07	250	2.28E+04	3760	0.	124.3	21	1.55E+07	250	6.00E+03	3760	0.	124.3
23	2.54E+07	271	2.37E+04	4065	0.		23	1.60E+07	271	1.82E+04	4065	0.	
25	2.40E+07	291	3.88E+04	4370	0.		25	1.80E+07	291	2.88E+04	4370	0.	
27	2.46E+07	311	3.05E+04	4676	0.		27	1.34E+07	311	1.89E+04	4676	0.	
IWC MED D	2.76E-03 20		4.38E-03 114		7.37E-03 204	TOTALS 166	IWC MED D	1.99E-03 19		1.76E-03 126		3.50E-03 199	TOTALS 170

AFML CIRRUS STUDY BY AFGL

FLIGHT E70-09 ON 21 MAR 70 30 SECOND AVERAGING
INTERVAL STARTS: 18123130*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (49)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (49)
2	5.05E+08	26	3.46E+05	437	3.24E+03	339.6	2	3.98E+08	26	2.01E+05	437	0.20E+02	339.3
3	3.07E+08	47	2.28E+05	706	1.48E+02		3	3.26E+08	47	1.40E+05	706	1.32E+03	
5	2.07E+08	67	1.28E+04	1011	3.08E+00	ALT (KM)	5	2.27E+08	67	1.30E+04	1011	3.03E+02	ALT (KM)
7	1.47E+08	87	3.31E+04	1316	0.	8.340	7	1.75E+08	87	1.29E+04	1316	6.74E+01	8.327
9	1.07E+08	108	1.91E+04	1622	0.	TEMP (C)	9	1.47E+08	108	2.01E+04	1622	1.75E+01	TEMP (C)
11	7.84E+07	128	1.28E+04	1927	0.	-34.2	11	9.38E+07	128	7.80E+03	1927	5.30E+00	-33.8
12	5.69E+07	148	6.06E+03	2233	0.	FROSTPOINT	12	7.39E+07	148	6.19E+03	2233	1.41E+00	FROSTPOINT
14	4.85E+07	169	3.33E+03	2538	0.	-33.4	14	8.19E+07	169	2.53E+03	2538	0.	-33.2
16	4.02E+07	189	4.50E+03	2843	0.		16	6.83E+07	189	1.82E+03	2843	0.	
18	3.02E+07	209	7.04E+03	3149	0.	TAS (M/S)	18	3.63E+07	209	1.00E+03	3149	0.	TAS (M/S)
19	2.12E+07	230	6.47E+03	3454	0.	124.4	19	2.44E+07	230	4.36E+03	3454	0.	122.5
21	1.47E+07	250	9.59E+03	3760	0.		21	2.62E+07	250	1.22E+03	3760	0.	
23	1.72E+07	271	1.29E+04	4065	0.		23	2.62E+07	271	0.	4665	0.	
25	2.12E+07	291	1.74E+04	4376	0.		25	2.91E+07	291	0.	4370	0.	
27	1.80E+07	311	1.38E+04	4676	0.		27	2.35E+07	311	0.	4676	0.	
IMC	2.66E-03		1.60E-03		3.52E-03	TOTALS	IMC	2.92E-03		3.34E-04		1.50E-02	TOTALS
MED D	20		121		205	5.12E-03	MED D	20		59		392	1.53E-02
						176							307

AFML CIRRUS STUDY BY AFGL

FLIGHT E70-09 ON 21 MAR 70 30 SECOND AVERAGING
INTERVAL STARTS: 18124130*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (49)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (49)
2	4.45E+08	26	3.13E+05	437	5.84E+03	339.9	2	3.97E+08	26	3.90E+05	437	0.38E+02	339.5
3	3.14E+08	47	2.11E+05	706	3.96E+02		3	3.34E+08	47	1.21E+05	706	1.35E+03	
5	2.31E+08	67	4.29E+03	1011	1.12E+02	ALT (KM)	5	2.41E+08	67	0.	1011	2.47E+02	ALT (KM)
7	1.64E+08	87	1.79E+04	1316	2.52E+01	8.335	7	1.87E+08	87	2.60E+03	1316	6.20E+01	8.324
9	1.13E+08	108	3.13E+04	1622	9.29E+00	TEMP (C)	9	1.39E+08	108	2.12E+04	1622	1.32E+01	TEMP (C)
11	8.41E+07	128	3.87E+03	1927	7.22E+00	-34.0	11	9.00E+07	128	2.62E+03	1927	6.00E+00	-33.8
12	5.97E+07	148	5.00E+03	2233	0.	FROSTPOINT	12	7.55E+07	148	6.20E+03	2233	2.13E+00	FROSTPOINT
14	7.36E+07	169	2.51E+03	2538	0.	-33.4	14	7.58E+07	169	1.71E+03	2538	7.56E-01	-33.9
16	6.21E+07	189	9.03E+03	2843	0.		16	6.24E+07	189	5.52E+03	2843	0.	
18	3.42E+07	209	3.94E+03	3149	0.	TAS (M/S)	18	4.23E+07	209	0.	3149	0.	TAS (M/S)
19	2.87E+07	230	1.41E+04	3454	0.	123.8	19	3.15E+07	230	0.	3454	0.	121.7
21	1.70E+07	250	6.01E+03	3760	0.		21	2.17E+07	250	0.	3760	0.	
23	1.83E+07	271	1.23E+04	4065	0.		23	2.31E+07	271	0.	4065	0.	
25	2.11E+07	291	2.52E+04	4370	0.		25	2.62E+07	291	0.	4370	0.	
27	1.67E+07	311	2.06E+04	4676	0.		27	2.51E+07	311	0.	4676	0.	
IMC	2.32E-03		1.93E-03		1.04E-02	TOTALS	IMC	2.70E-03		2.22E-04		1.43E-02	TOTALS
MED D	19		125		258	1.23E-02	MED D	20		56		377	1.49E-02
						227							374

AFGL CIRRUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS:10:25:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	4.34E+00	26	7.10E+04	437	3.90E+02	339.4
3	3.80E+00	47	5.62E+04	706	6.30E+02	
5	2.31E+00	67	0.	1811	5.85E+01	ALT (KM)
7	1.66E+00	87	7.64E+03	1316	7.77E+00	8.325
9	1.13E+00	108	1.87E+04	1622	2.52E+00	TEMP (C)
11	9.26E+07	128	0.	1927	0.	-33.8
12	6.52E+07	148	2.07E+03	2233	0.	
14	7.17E+07	169	0.	2538	0.	FROSTPOINT
16	6.33E+07	189	0.	2843	0.	-34.1
18	3.33E+07	209	1.00E+03	3149	0.	
19	3.22E+07	230	0.	3454	0.	TAS (M/S)
21	1.85E+07	250	0.	3760	0.	121.1
23	1.96E+07	271	0.	4065	0.	
25	2.84E+07	291	0.	4378	0.	
27	1.82E+07	311	0.	4676	0.	
IMC MED 0	2.40E-03	19	8.00E-05	53	4.51E-03	TOTALS
					328	4.59E-03
						326

AFGL CIRRUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS:10:25:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	7.11E+08	26	0.	437	1.65E+01	339.7
3	2.84E+08	47	0.	706	2.67E+01	
5	1.95E+08	67	0.	1811	5.72E-01	ALT (KM)
7	1.33E+08	87	0.	1316	0.	8.319
9	9.06E+07	108	0.	1622	0.	TEMP (C)
11	7.09E+07	128	0.	1927	0.	-33.7
12	3.97E+07	148	0.	2233	0.	
14	5.12E+07	169	0.	2538	0.	FROSTPOINT
16	4.31E+07	189	0.	2843	0.	-34.5
18	2.31E+07	209	0.	3149	0.	
19	1.83E+07	230	1.11E+03	3454	0.	TAS (M/S)
21	1.24E+07	250	0.	3760	0.	120.4
23	9.57E+06	271	0.	4065	0.	
25	7.60E+06	291	0.	4378	0.	
27	3.94E+06	311	0.	4676	0.	
IMC MED 0	1.35E-03	17	1.22E-05	100	1.48E-04	TOTALS
					386	1.61E-04
						299

INTERVAL STARTS:10:26:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	5.26E+00	26	0.	437	2.65E+02	339.7
3	3.15E+00	47	2.02E+04	706	4.20E+02	
5	2.23E+00	67	8.02E+03	1811	2.91E+01	ALT (KM)
7	1.65E+00	87	7.88E+03	1316	3.61E+00	8.320
9	1.13E+00	108	3.57E+03	1622	0.	TEMP (C)
11	8.46E+07	128	1.32E+03	1927	0.	-33.6
12	6.32E+07	148	0.	2233	0.	
14	7.80E+07	169	2.50E+03	2538	0.	FROSTPOINT
16	5.93E+07	189	1.06E+03	2843	0.	-34.3
18	3.12E+07	209	1.01E+03	3149	0.	
19	2.16E+07	230	0.	3454	0.	TAS (M/S)
21	2.19E+07	250	0.	3760	0.	120.6
23	2.44E+07	271	0.	4065	0.	
25	1.94E+07	291	0.	4378	0.	
27	1.74E+07	311	0.	4676	0.	
IMC MED 0	2.33E-03	28	7.40E-05	82	2.77E-03	TOTALS
					318	2.84E-03
						316

INTERVAL STARTS:10:27:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	6.06E+08	26	2.07E+05	437	6.73E+02	339.7
3	3.04E+08	47	4.71E+04	706	9.08E+01	
5	1.89E+08	67	4.43E+03	1811	1.26E+01	ALT (KM)
7	1.30E+08	87	5.27E+03	1316	0.	8.319
9	9.50E+07	108	2.15E+04	1622	0.	TEMP (C)
11	7.08E+07	128	3.98E+03	1927	0.	-33.7
12	5.16E+07	148	2.09E+03	2233	0.	
14	5.47E+07	169	0.	2538	0.	FROSTPOINT
16	5.36E+07	189	0.	2843	0.	-34.0
18	3.11E+07	209	0.	3149	0.	
19	1.89E+07	230	0.	3454	0.	TAS (M/S)
21	1.78E+07	250	2.48E+03	3760	0.	120.2
23	1.66E+07	271	2.22E+03	4065	0.	
25	1.24E+07	291	1.99E+03	4378	0.	
27	8.74E+06	311	1.71E+03	4676	0.	
IMC MED 0	1.73E-03	18	2.96E-04	109	1.18E-03	TOTALS
					247	1.47E-03
						218

AFML CIRQUE STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS*18:27:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: RULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MM)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MM)
2	6.50E+08	26	7.19E+04	437	5.44E+02	333.9	2	6.57E+08	26	1.08E+05	437	3.53E+02	333.7
3	2.70E+08	47	0.	706	1.77E+02		3	2.65E+08	47	4.74E+04	706	5.81E+01	ALT (KM)
5	1.87E+08	67	0.	1011	1.89E+01	8.317	5	1.90E+08	67	0.	1011	2.30E+00	8.316
7	1.32E+08	87	0.	1316	2.42E+00		7	1.21E+08	87	2.65E+03	1316	0.	TEMP (C)
9	1.04E+08	108	0.	1622	0.		9	9.40E+07	108	5.40E+03	1622	0.	-33.7
11	7.97E+07	124	1.33E+03	1927	0.		11	7.53E+07	124	1.05E+03	1927	0.	FROSTPOINT
12	4.80E+07	148	1.05E+03	2233	0.		12	5.72E+07	148	1.73E+03	2233	0.	-33.3
14	5.89E+07	169	1.78E+03	2538	0.		14	5.55E+07	169	3.73E+03	2538	0.	
15	5.03E+07	189	2.79E+03	2843	0.		15	4.33E+07	189	2.04E+03	2843	0.	TAS (M/S)
16	2.61E+07	209	0.	3149	0.		16	2.86E+07	209	0.	3149	0.	113.7
18	1.64E+07	230	0.	3454	0.		18	2.07E+07	230	0.	3454	0.	
21	1.84E+07	250	0.	3760	0.		21	1.04E+07	250	0.	3760	0.	
23	1.75E+07	271	5.00E+02	4065	0.		23	1.02E+07	271	4.47E+02	4065	0.	
25	1.70E+07	291	9.99E+02	4370	0.		25	1.04E+07	291	9.34E+02	4370	0.	
27	1.21E+07	311	5.19E+02	4676	0.		27	7.93E+06	311	8.17E+02	4676	0.	
IMC MED	1.20E-03 19		1.00E-04 120		1.64E-03 299	TOTALS	IMC MED	1.54E-03 18		1.64E-04 83		6.08E-04 244	TOTALS
						1.74E-03 291						7.72E-04 215	

AFML CIRQUE STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS*18:28:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: RULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MM)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MM)
2	7.10E+08	26	0.	437	3.05E+01	333.8	2	6.17E+08	26	3.60E+04	437	0.	333.8
3	2.82E+08	47	1.30E+04	706	4.93E+01		3	3.07E+08	47	0.	706	0.	ALT (KM)
5	1.77E+08	67	0.	1011	1.19E+00	8.317	5	2.01E+08	67	0.	1011	0.	8.318
7	1.32E+08	87	0.	1316	0.		7	1.50E+08	87	0.	1316	0.	TEMP (C)
9	9.03E+07	108	5.40E+03	1622	0.		9	1.22E+08	108	1.90E+03	1622	0.	-33.7
11	7.59E+07	124	6.56E+03	1927	0.		11	7.86E+07	124	1.33E+03	1927	0.	FROSTPOINT
12	5.61E+07	148	2.10E+03	2233	0.		12	5.23E+07	148	1.05E+03	2233	0.	-33.3
14	5.61E+07	169	3.46E+03	2538	0.		14	6.25E+07	169	8.55E+02	2538	0.	
16	4.64E+07	189	3.36E+02	2843	0.		16	5.03E+07	189	2.80E+03	2843	0.	TAS (M/S)
18	1.67E+07	209	3.05E+03	3149	0.		18	2.46E+07	209	0.	3149	0.	119.8
19	2.07E+07	230	3.36E+03	3454	0.		19	1.56E+07	230	2.24E+03	3454	0.	
21	1.36E+07	250	0.	3760	0.		21	1.41E+07	250	1.25E+03	3760	0.	
23	1.29E+07	271	0.	4065	0.		23	1.05E+07	271	0.	4065	0.	
25	1.10E+07	291	0.	4370	0.		25	7.07E+06	291	0.	4370	0.	
27	9.65E+05	311	0.	4676	0.		27	3.68E+05	311	0.	4676	0.	
IMC MED	1.57E-03 19		1.36E-04 81		2.76E-04 306	TOTALS	IMC MED	1.48E-03 16		8.10E-05 97		0.	TOTALS
						4.12E-04 267						8.10E-05 37	

AFML CIRRUS STUDY 9Y AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS:18:29:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: GULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (49)
2	6.03E+09	26	0.	437	0.	333.5
3	3.01E+08	47	0.	706	0.	
5	2.32E+09	67	0.	1011	0.	ALT (KM)
7	1.58E+08	87	0.	1316	0.	8.322
9	1.18E+08	108	0.	1622	0.	TEMP (C)
11	8.20E+07	128	0.	1927	0.	-33.5
12	6.04E+07	148	0.	2233	0.	
14	5.59E+07	169	0.	2538	0.	FROSTPOINT
15	4.45E+07	189	0.	2843	0.	-32.3
18	2.55E+07	209	0.	3149	0.	TAS (M/S)
19	1.74E+07	230	0.	3454	0.	121.1
21	1.26E+07	250	0.	3760	0.	
23	9.23E+06	271	0.	4065	0.	TOTALS
25	8.11E+06	291	0.	4370	0.	8.34E-06
27	6.16E+06	311	0.	4676	0.	91
IMC	1.51E-03		3.34E-06		0.	0
MED D	17		91			

AFML CIRRUS STUDY 9Y AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS:18:30:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: GULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (49)
2	4.96E+08	26	0.	437	2.03E+02	333.4
3	3.22E+08	47	9.33E+03	706	6.47E+00	
5	2.18E+08	67	8.72E+03	1011	0.	ALT (KM)
7	1.55E+08	87	6.00E+03	1316	0.	5.326
9	1.02E+08	108	0.	1622	0.	TEMP (C)
11	6.50E+07	128	0.	1927	0.	-31.6
12	6.49E+07	148	0.	2233	0.	
14	6.83E+07	169	1.71E+03	2538	0.	FROSTPOINT
15	5.01E+07	189	9.19E+02	2843	0.	-32.5
18	2.90E+07	209	9.99E+02	3149	0.	TAS (M/S)
19	2.28E+07	230	0.	3454	0.	121.7
21	1.81E+07	250	0.	3760	0.	
23	1.00E+07	271	6.13E+02	4065	0.	TOTALS
25	1.92E+07	291	1.23E+03	4370	0.	3.00E-04
27	1.28E+07	311	9.54E+02	4676	0.	170
IMC	1.87E-03		1.01E-04		1.99E-04	203
MED D	19		123			

INTERVAL STARTS:18:30:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: GULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (49)
2	5.50E+08	26	0.	437	7.43E+01	333.3
3	3.19E+08	47	0.	706	1.62E+00	
5	2.08E+08	67	0.	1011	0.	ALT (KM)
7	1.49E+08	87	0.	1316	0.	8.323
9	1.06E+08	108	0.	1622	0.	TEMP (C)
11	7.72E+07	128	0.	1927	0.	-33.6
12	5.49E+07	148	0.	2233	0.	
14	5.43E+07	169	0.	2538	0.	FROSTPOINT
15	4.46E+07	189	9.18E+02	2843	0.	-32.5
18	2.79E+07	209	0.	3149	0.	TAS (M/S)
19	1.92E+07	230	0.	3454	0.	121.5
21	1.67E+07	250	0.	3760	0.	
23	1.09E+07	271	2.30E+02	4065	0.	TOTALS
25	1.39E+07	291	4.59E+02	4370	0.	9.56E-05
27	9.75E+06	311	3.57E+02	4676	0.	198
IMC	1.71E-03		2.97E-05		6.59E-05	172
MED D	18		127			

INTERVAL STARTS:18:31:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: GULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (49)
2	5.02E+08	26	0.	437	3.51E+01	333.3
3	3.35E+08	47	1.34E+04	706	5.66E+01	
5	2.40E+08	67	0.	1011	2.26E+00	ALT (KM)
7	1.71E+08	87	2.60E+03	1316	0.	9.326
9	1.19E+08	108	3.54E+03	1622	0.	TEMP (C)
11	8.07E+07	128	1.32E+03	1927	0.	-33.5
12	5.84E+07	148	1.03E+03	2233	0.	
14	6.57E+07	169	8.48E+02	2538	0.	FROSTPOINT
15	2.78E+07	189	0.	2843	0.	-32.4
18	2.17E+07	209	1.00E+03	3149	0.	TAS (M/S)
19	1.86E+07	230	1.10E+03	3454	0.	121.8
21	1.98E+07	250	0.	3760	0.	
23	1.56E+07	271	0.	4065	0.	TOTALS
25	1.56E+07	291	0.	4370	0.	3.80E-04
27	1.56E+07	311	0.	4676	0.	296
IMC	2.07E-03		5.09E-05		3.29E-04	309
MED D	19		73			

AFWL CIRRUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL START*16:32:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-NM)
TYPE: BULL-ROSE

INTERVAL STARTS: *10:32:00*													
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)													
TYPE: 9ULL-ROSE													
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (49)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (49)
2	5.09E+08	26	0.	437	6.97E+01	333.3	2	5.16E+08	26	3.55E+04	437	2.34E+00	333.5
3	3.22E+08	47	9.33E+03	706	1.42E+02		3	3.20E+08	47	0.	706	3.78E+00	
5	2.24E+08	67	0.	1011	2.84E+00		5	2.30E+08	67	0.	1011	0.	8.323
7	1.69E+08	87	0.	1316	0.		7	1.73E+08	87	0.	1316	0.	
9	1.07E+08	108	3.55E+03	1622	0.	TEMP (C)	9	1.25E+08	108	0.	1622	0.	TEMP (C)
11	7.84E+07	128	2.63E+03	1927	0.	-33.3	11	9.76E+07	128	0.	1927	0.	-33.2
12	6.25E+07	148	0.	2233	0.		12	5.63E+07	148	0.	2233	0.	
14	6.11E+07	169	8.53E+02	2538	0.		14	6.75E+07	169	0.	2538	0.	FROSTPOINT
16	5.64E+07	189	0.	2843	0.	-33.0	16	5.46E+07	189	9.21E+02	2843	0.	-31.9
18	2.79E+07	209	1.04E+03	3149	0.		18	2.90E+07	209	1.00E+03	3149	0.	
19	2.40E+07	230	0.	3454	0.		19	2.70E+07	230	0.	3454	0.	TAS (M/S)
21	1.34E+07	250	0.	3760	0.	121.5	21	1.53E+07	250	0.	3760	0.	121.5
23	1.87E+07	271	0.	4065	0.		23	1.51E+07	271	0.	4065	0.	
25	1.42E+07	291	0.	4370	0.		25	1.44E+07	291	0.	4370	0.	
27	1.00E+07	311	0.	4676	0.		27	6.41E+06	311	0.	4676	0.	
TOTALS						TOTALS	TOTALS						
3.15E+05						6.31E-04	1.87E-05						
65						306	86						
1.94E-03						6.62E-04	1.99E-05						
10						302	301						
MED D						MED D	MED D						
16						302	17						
3.06E-05						3.06E-05	3.06E-05						
169						169	169						

INTERVAL START: *18:33:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M*3-MM)
TYPE: QULL-ROSE

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AFML CIRRUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS: 18:33:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	4.91E+08	26	3.55E+04	437	0.	339.5
3	3.42E+08	47	0.	706	0.	ALT (KM)
5	2.36E+08	67	0.	1011	0.	8.323
7	1.68E+08	87	0.	1316	0.	TEMP (C)
9	1.24E+08	108	0.	1622	0.	-33.2
11	9.66E+07	128	0.	1927	0.	FROSTPOINT
12	7.65E+07	148	0.	2233	0.	-31.9
14	7.76E+07	169	0.	2538	0.	TAS (M/S)
16	6.67E+07	189	0.	2843	0.	121.4
18	3.43E+07	209	0.	3149	0.	TOTALS
19	2.65E+07	230	0.	3454	0.	4.52E-06
21	2.09E+07	250	0.	3760	0.	22
23	2.07E+07	271	0.	4065	0.	IMC
25	1.42E+07	291	0.	4370	0.	MED D
27	9.21E+06	311	0.	4676	0.	22
IMC	2.21E-03		4.52E-06		0.	0
MED D	18		22			

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS: 18:34:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	4.55E+08	26	3.56E+04	437	2.29E+02	339.5
3	3.45E+08	47	0.	706	1.46E+01	ALT (KM)
5	2.52E+08	67	0.	1011	0.	8.323
7	1.87E+08	87	2.59E+03	1316	0.	TEMP (C)
9	1.29E+08	108	1.78E+03	1622	0.	-33.0
11	1.16E+08	128	2.63E+03	1927	0.	FROSTPOINT
12	7.18E+07	148	0.	2233	0.	-32.0
14	6.74E+07	169	0.	2538	0.	TAS (M/S)
16	7.35E+07	189	9.25E+02	2843	0.	121.3
18	3.86E+07	209	1.01E+03	3149	0.	TOTALS
19	2.96E+07	230	0.	3454	0.	4.26E-04
21	1.87E+07	250	3.68E+03	3760	0.	209
23	2.32E+07	271	1.91E+03	4065	0.	IMC
25	1.62E+07	291	9.88E+02	4370	0.	MED D
27	1.17E+07	311	8.07E+02	4676	0.	113
IMC	2.42E-03		1.64E-04		2.62E-04	166
MED D	18					

INTERVAL STARTS: 18:34:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	5.88E+08	26	1.07E+05	437	1.08E+02	339.6
3	3.09E+08	47	0.	706	1.09E+00	ALT (KM)
5	2.36E+08	67	0.	1011	0.	8.321
7	1.62E+08	87	0.	1316	0.	TEMP (C)
9	1.17E+08	108	0.	1622	0.	-33.1
11	9.49E+07	128	0.	1927	0.	FROSTPOINT
12	6.86E+07	148	0.	2233	0.	-31.9
14	6.46E+07	169	0.	2538	0.	TAS (M/S)
16	6.54E+07	189	9.26E+02	2843	0.	121.3
18	3.44E+07	209	0.	3149	0.	TOTALS
19	2.88E+07	230	0.	3454	0.	1.82E-04
21	1.37E+07	250	1.22E+03	3760	0.	139
23	2.07E+07	271	1.06E+03	4065	0.	IMC
25	1.59E+07	291	9.25E+02	4370	0.	MED D
27	1.06E+07	311	6.86E+02	4676	0.	119
IMC	2.19E-03		9.46E-05		8.76E-05	194
MED D	18					

INTERVAL STARTS: 18:35:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	4.72E+08	26	1.07E+05	437	2.44E+01	339.4
3	3.43E+08	47	3.73E+04	706	3.94E+01	ALT (KM)
5	2.38E+08	67	0.	1011	1.13E+00	8.324
7	1.91E+08	87	5.22E+03	1316	0.	TEMP (C)
9	1.23E+08	108	1.77E+03	1622	0.	-32.9
11	1.04E+08	128	0.	1927	0.	FROSTPOINT
12	7.02E+07	148	2.06E+03	2233	0.	-32.2
14	7.66E+07	169	8.53E+02	2538	0.	TAS (M/S)
16	6.04E+07	189	9.24E+02	2843	0.	121.7
18	3.32E+07	209	1.00E+03	3149	0.	TOTALS
19	2.70E+07	230	2.21E+03	3454	0.	3.13E-04
21	2.26E+07	250	0.	3760	0.	275
23	1.73E+07	271	0.	4065	0.	IMC
25	1.92E+07	291	0.	4370	0.	MED D
27	1.42E+07	311	0.	4676	0.	73
IMC	2.32E-03		9.01E-05		2.23E-04	307
MED D	19					

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL START:18:35:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: GULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	3.68E+08	26	1.76E+05	1.23E+02	339.2	2	5.15E+08	26	0.	2.36E+02	339.2
3	3.68E+08	47	1.67E+05	1.09E+02		3	3.58E+08	47	0.	1.23E+01	
5	2.59E+08	67	8.70E+03	2.09E+01	8.328	5	2.43E+08	67	0.	0.	8.329
7	1.83E+08	87	2.59E+03	2.97E+00		7	1.67E+08	87	0.	0.	
9	1.34E+08	108	8.83E+03	0.		9	1.10E+08	108	0.	0.	TEMP (C)
11	1.16E+08	128	3.92E+03	0.	-33.1	11	9.45E+07	128	0.	0.	-33.0
12	7.30E+07	148	2.06E+03	0.		12	6.07E+07	148	0.	0.	FROSTPOINT
14	8.81E+07	169	0.	0.		14	6.54E+07	169	0.	0.	-31.6
16	8.61E+07	189	0.	0.		16	5.02E+07	189	0.	0.	
18	4.05E+07	209	1.00E+03	0.		18	3.21E+07	209	0.	0.	TAS (M/S)
19	2.86E+07	230	0.	0.		19	2.02E+07	230	0.	0.	122.2
21	2.81E+07	250	1.22E+03	0.		21	1.44E+07	250	1.22E+03	0.	
23	2.19E+07	271	0.	0.		23	1.25E+07	271	1.18E+03	4065	
25	2.33E+07	291	0.	0.		25	1.16E+07	291	1.13E+03	4370	
27	1.44E+07	311	0.	0.		27	6.10E+06	311	9.11E+02	4676	
IMC MED D	2.72E-03 19		1.63E-04 37	1.43E-03 328		TOTALS			8.79E-05 125	2.57E-04 206	TOTALS
											3.45E-04 184

AFML CIRRUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL START:18:35:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: GULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	3.68E+08	26	1.76E+05	1.23E+02	339.2	2	5.15E+08	26	0.	2.36E+02	339.2
3	3.68E+08	47	1.67E+05	1.09E+02		3	3.58E+08	47	0.	1.23E+01	
5	2.59E+08	67	8.70E+03	2.09E+01	8.328	5	2.43E+08	67	0.	0.	8.329
7	1.83E+08	87	2.59E+03	2.97E+00		7	1.67E+08	87	0.	0.	
9	1.34E+08	108	8.83E+03	0.		9	1.10E+08	108	0.	0.	TEMP (C)
11	1.16E+08	128	3.92E+03	0.	-33.1	11	9.45E+07	128	0.	0.	-33.0
12	7.30E+07	148	2.06E+03	0.		12	6.07E+07	148	0.	0.	FROSTPOINT
14	8.81E+07	169	0.	0.		14	6.54E+07	169	0.	0.	-31.6
16	8.61E+07	189	0.	0.		16	5.02E+07	189	0.	0.	
18	4.05E+07	209	1.00E+03	0.		18	3.21E+07	209	0.	0.	TAS (M/S)
19	2.86E+07	230	0.	0.		19	2.02E+07	230	0.	0.	122.2
21	2.81E+07	250	1.22E+03	0.		21	1.44E+07	250	1.22E+03	0.	
23	2.19E+07	271	0.	0.		23	1.25E+07	271	1.18E+03	4065	
25	2.33E+07	291	0.	0.		25	1.16E+07	291	1.13E+03	4370	
27	1.44E+07	311	0.	0.		27	6.10E+06	311	9.11E+02	4676	
IMC MED D	2.72E-03 19		1.63E-04 37	1.43E-03 328		TOTALS			8.79E-05 125	2.57E-04 206	TOTALS
											3.45E-04 184

INTERVAL START:18:37:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: SMALL SNOW

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	4.75E+08	26	3.52E+04	8.21E+01	339.1	2	5.93E+08	26	6.23E+05	6.77E+03	339.4
3	3.42E+08	47	5.56E+04	1.07E+00		3	2.68E+08	49	4.10E+05	3.79E+01	
5	2.44E+08	67	0.	0.	8.331	5	1.68E+08	72	4.23E+04	9.96E-01	8.324
7	1.79E+08	87	6.59E+03	0.		7	1.52E+08	95	8.02E+04	0.	
9	1.27E+08	108	1.76E+03	0.		9	1.01E+08	118	9.04E+04	1778	TEMP (C)
11	1.06E+08	128	1.30E+03	0.	-33.2	11	8.83E+07	141	3.34E+04	2123	-32.8
12	7.89E+07	148	0.	0.		12	4.29E+07	164	1.09E+04	2468	FROSTPOINT
14	7.70E+07	169	0.	0.		14	5.70E+07	187	8.24E+03	2813	-32.5
16	5.92E+07	189	9.14E+02	0.	-31.9	16	4.68E+07	210	1.94E+04	3158	
18	3.49E+07	209	9.96E+02	0.		18	2.63E+07	233	4.23E+04	3503	TAS (M/S)
19	2.69E+07	230	0.	0.		19	2.13E+07	256	7.47E+04	3848	122.4
21	1.63E+07	250	0.	0.		21	1.69E+07	279	5.39E+04	4193	
23	2.24E+07	271	3.05E+02	0.		23	1.69E+07	302	7.01E+04	4538	
25	1.52E+07	291	6.09E+02	0.		25	1.33E+07	325	9.12E+04	4883	
27	9.97E+06	311	4.62E+02	0.		27	1.30E+07	348	5.95E+04	5228	
IMC MED D	2.21E-03 18		8.29E-05 85	6.78E-05 195		TOTALS			1.95E-02 158	5.96E-03 218	TOTALS
											2.54E-02 165

AFWL CIRRHUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS:18:38:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: SMALL SNOW

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	6.31E+08	26	6.26E+05	465	4.16E+03	339.5	2	6.24E+08	26	7.55E+05	3.98E+03
3	2.55E+08	49	3.54E+05	743	1.38E+01		3	2.56E+08	49	3.81E+05	743
5	1.79E+08	72	1.55E+04	1088	1.50E+00	8.323	5	1.87E+08	72	3.11E+04	1088
7	1.39E+08	95	4.83E+04	1433	0.		7	1.43E+08	95	2.31E+04	1433
9	1.14E+08	118	5.32E+04	1778	0.	TEMP (C)	9	9.29E+07	118	6.45E+04	1778
11	6.73E+07	141	1.51E+04	2123	0.	-32.8	11	7.83E+07	141	1.63E+04	2123
12	4.87E+07	164	1.59E+04	2468	0.		12	5.69E+07	164	9.16E+03	2468
14	4.98E+07	187	3.76E+03	2813	0.	FROSTPOINT	14	5.48E+07	187	4.54E+03	2813
16	4.34E+07	210	1.14E+04	3158	0.	-32.1	16	4.59E+07	210	1.47E+04	3158
18	2.50E+07	233	1.95E+04	3503	0.		18	2.68E+07	233	1.87E+04	3503
19	1.86E+07	256	4.68E+04	3848	0.	TAS (M/S)	19	1.33E+07	256	3.23E+04	3848
21	1.75E+07	279	4.76E+04	4193	0.	121.8	21	1.37E+07	279	3.16E+04	4193
23	1.06E+07	302	5.83E+04	4538	0.		23	1.37E+07	302	4.48E+04	4538
25	1.28E+07	325	7.13E+04	4883	0.		25	1.53E+07	325	6.34E+04	4883
27	8.35E+06	348	4.47E+04	5228	0.		27	9.75E+06	348	4.02E+04	5228
IWC	1.61E-03		1.45E-02	159		TOTALS	IWC	1.67E-03		1.21E-02	160
MED D	18				218	1.80E-02	MED D	18		218	1.59E-02
					164						165

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AFWL CIRRHUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS:18:39:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: SMALL SNOW

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	6.08E+08	26	5.34E+05	465	3.62E+03	339.8	2	5.54E+08	26	8.24E+05	4.68E+03
3	2.77E+08	49	2.81E+05	743	2.87E+01		3	2.81E+08	49	4.42E+05	743
5	1.72E+08	72	1.55E+04	1088	5.03E-01	9.316	5	1.78E+08	72	1.17E+04	1088
7	1.32E+08	95	2.77E+04	1433	0.		7	1.33E+08	95	3.26E+04	1433
9	9.93E+07	118	4.56E+04	1778	0.	TEMP (C)	9	9.61E+07	118	6.34E+04	1778
11	6.50E+07	141	1.51E+04	2123	0.	-32.9	11	7.69E+07	141	1.88E+04	2123
12	4.63E+07	164	1.10E+04	2468	0.		12	5.24E+07	164	1.11E+04	2468
14	5.02E+07	187	3.77E+03	2813	0.	FROSTPOINT	14	5.77E+07	187	4.57E+03	2813
16	4.61E+07	210	7.34E+03	3158	0.	-32.1	16	4.96E+07	210	9.05E+03	3158
18	2.54E+07	233	5.34E+03	3503	0.		18	2.54E+07	233	8.98E+03	3503
19	1.79E+07	256	1.08E+04	3848	0.	TAS (M/S)	19	2.11E+07	256	1.48E+04	3848
21	1.17E+07	279	9.78E+03	4193	0.	121.4	21	1.49E+07	279	1.97E+04	4193
23	1.17E+07	302	2.00E+04	4538	0.		23	1.49E+07	302	3.42E+04	4538
25	1.31E+07	325	4.07E+04	4883	0.		25	1.52E+07	325	5.92E+04	4883
27	9.21E+06	348	2.74E+04	5228	0.		27	9.86E+06	348	3.91E+04	5228
IWC	1.57E-03		6.78E-03	163		TOTALS	IWC	1.77E-03		1.01E-02	163
MED D	18				218	1.01E-02	MED D	19		218	1.42E-02
					170						169

AFWL CIRRUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL START*18:40:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: SMALL SNOW

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (M9)	339.7	PRECIP PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	SCATTER PROBE	SIZE (MU)	P (M9)	339.4	PRECIP PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	SCATTER PROBE	SIZE (MU)	P (M9)	339.4
2	5.14E+08	26	6.44E+05	465	6.05E+03	ALT (KM)	8.320	6.46E+01	465	0.	26	2.92E+08	2	2.92E+08	339.4	1.75E+02	465	0.	26	2.92E+08	2	2.92E+08	339.4
3	2.84E+08	49	6.32E+05	743	6.46E+01	ALT (KM)	8.320	6.46E+01	743	8.24E+03	49	4.01E+08	3	4.01E+08	339.4	4.33E+00	743	8.24E+03	49	4.01E+08	3	4.01E+08	339.4
5	2.00E+08	72	3.51E+04	1088	1.01E+00	ALT (KM)	8.320	1.01E+00	1088	3.86E+03	72	3.18E+08	5	3.18E+08	339.4	0.	1088	3.86E+03	72	3.18E+08	5	3.18E+08	339.4
7	1.57E+08	95	3.72E+04	1433	0.	TEMP (C)	-32.5	0.	1433	0.	95	2.56E+08	7	2.56E+08	339.4	0.	1433	0.	95	2.56E+08	7	2.56E+08	339.4
9	1.15E+08	118	6.48E+04	1778	0.	TEMP (C)	-32.5	0.	1778	0.	118	1.90E+08	9	1.90E+08	339.4	0.	1778	0.	118	1.90E+08	9	1.90E+08	339.4
11	8.32E+07	141	2.50E+04	2123	0.	TEMP (C)	-32.5	0.	2123	0.	141	1.53E+08	11	1.53E+08	339.4	0.	2123	0.	141	1.53E+08	11	1.53E+08	339.4
12	5.76E+07	164	1.29E+04	2468	0.	TEMP (C)	-32.5	0.	2468	0.	164	1.47E+08	12	1.47E+08	339.4	0.	2468	0.	164	1.47E+08	12	1.47E+08	339.4
14	6.72E+07	187	3.03E+03	2813	0.	FROSTPOINT	-32.3	0.	2813	0.	187	1.45E+08	14	1.45E+08	339.4	0.	2813	0.	187	1.45E+08	14	1.45E+08	339.4
16	5.03E+07	210	5.74E+03	3158	0.	FROSTPOINT	-32.3	0.	3158	0.	210	1.11E+08	16	1.11E+08	339.4	0.	3158	0.	210	1.11E+08	16	1.11E+08	339.4
18	2.84E+07	233	1.34E+04	3503	0.	TAS (M/S)	120.6	0.	3503	0.	233	0.56E+07	18	0.56E+07	339.4	0.	3503	0.	233	0.56E+07	18	0.56E+07	339.4
19	2.42E+07	256	1.46E+04	3848	0.	TAS (M/S)	120.6	0.	3848	0.	256	4.58E+07	19	4.58E+07	339.4	0.	3848	0.	256	4.58E+07	19	4.58E+07	339.4
21	1.85E+07	279	1.53E+04	4193	0.	TAS (M/S)	120.6	0.	4193	0.	279	3.60E+07	21	3.60E+07	339.4	0.	4193	0.	279	3.60E+07	21	3.60E+07	339.4
23	1.77E+07	302	3.01E+04	4538	0.	TAS (M/S)	120.6	0.	4538	0.	302	3.41E+07	23	3.41E+07	339.4	0.	4538	0.	302	3.41E+07	23	3.41E+07	339.4
25	1.69E+07	325	5.91E+04	4883	0.	TAS (M/S)	120.6	0.	4883	0.	325	3.46E+07	25	3.46E+07	339.4	0.	4883	0.	325	3.46E+07	25	3.46E+07	339.4
27	1.49E+07	348	4.07E+04	5228	0.	TAS (M/S)	120.6	0.	5228	0.	348	2.60E+07	27	2.60E+07	339.4	0.	5228	0.	348	2.60E+07	27	2.60E+07	339.4
TOTALS						TOTALS																	
IWC	2.07E-03		1.01E-02		5.67E-03	1.58E-02			IWC	2.36E-04		3.93E-03		1.58E-02		1.78E-04		2.36E-04		3.93E-03		1.58E-02	
ED	0		163		219	171			ED	156		19		171		222		156		19		222	

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INTERVAL START: *18:40:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: SMALL SNOW

[illegible]

INTERVAL START:10:41:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: SMALL SNOW

AFML CIRRUS STUDY BY AFGL

FLIGHT E70-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS: 18:42:00
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: SMALL SNOW

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MM)	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MM)
2	4.86E+00	26	0.	465	1.74E+02	339.5	2	4.61E+00	26	2.95E+02	344.7
3	3.53E+00	49	8.26E+03	743	7.18E+00		3	3.43E+00	49	4.71E+02	
5	2.51E+00	72	0.	1080	0.		5	2.40E+00	72	0.	
7	1.85E+00	95	2.31E+03	1433	0.	8.323	7	1.74E+00	95	0.	
9	1.23E+00	118	1.57E+03	1778	0.		9	1.23E+00	118	3.21E+03	
11	9.48E+07	141	2.33E+03	2123	0.	-33.0	11	7.89E+07	141	2.42E+03	
12	6.08E+07	164	1.83E+03	2468	0.		12	6.20E+07	164	1.89E+03	
14	5.16E+07	187	7.53E+02	2813	0.		14	6.97E+07	187	0.	
16	5.16E+07	210	0.	3158	0.	-31.8	16	5.34E+07	210	8.50E+02	
18	2.99E+07	233	0.	3503	0.		18	2.81E+07	233	9.39E+02	
19	2.62E+07	256	0.	3848	0.		19	2.12E+07	256	0.	
21	1.56E+07	279	1.09E+03	4193	0.		21	1.43E+07	279	0.	
23	1.67E+07	302	9.42E+02	4538	0.	121.4	23	1.41E+07	302	0.	
25	1.08E+07	325	8.18E+02	4883	0.		25	1.06E+07	325	0.	
27	9.78E+06	348	6.33E+02	5228	0.		27	6.04E+06	348	0.	
IWC MED D	1.92E-03 10		2.40E-04 153			TOTALS 174	IWC MED D	1.76E-03 17			TOTALS 312
						4.36E-04 225		1.37E-04 88			4.01E-03 314

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AFML CIRRUS STUDY BY AFGL

FLIGHT E70-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS: 18:42:00
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: SMALL SNOW

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MM)	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MM)
2	4.37E+00	26	0.	465	1.06E+01	339.4	2	4.81E+00	26	3.30E+04	359.7
3	3.63E+00	49	8.32E+03	743	1.69E+01		3	2.85E+00	49	1.39E+05	
5	2.63E+00	72	0.	1080	0.	8.326	5	1.91E+00	72	1.22E+04	
7	1.86E+00	95	0.	1433	0.		7	1.40E+00	95	9.70E+03	
9	1.33E+00	118	0.	1778	0.		9	1.07E+00	118	2.31E+04	
11	8.42E+07	141	1.17E+03	2123	0.	-33.0	11	7.49E+07	141	1.46E+04	
12	6.98E+07	164	9.21E+02	2468	0.		12	5.74E+07	164	4.79E+03	
14	7.72E+07	187	0.	2813	0.		14	5.92E+07	187	2.38E+03	
16	6.98E+07	210	0.	3158	0.	-31.7	16	4.48E+07	210	5.13E+03	
18	3.43E+07	233	0.	3503	0.		18	2.78E+07	233	1.87E+03	
19	2.30E+07	256	0.	3848	0.		19	2.05E+07	256	2.06E+03	
21	1.54E+07	279	0.	4193	0.		21	1.58E+07	279	0.	
23	1.43E+07	302	0.	4538	0.	120.7	23	1.35E+07	302	2.85E+02	
25	1.43E+07	325	0.	4883	0.		25	1.05E+07	325	5.69E+02	
27	9.82E+06	348	0.	5228	0.		27	7.02E+06	348	6.12E+02	
IWC MED D	2.07E-03 17		2.51E-05 89			TOTALS 279	IWC MED D	1.65E-03 18			TOTALS 320
						1.82E-04 293		7.75E-04 93			1.74E-02 324

INTERVAL STARTS: 18:42:30
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: SMALL SNOW

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MM)	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MM)
2	4.37E+00	26	0.	465	1.06E+01	339.4	2	4.81E+00	26	3.30E+04	359.7
3	3.63E+00	49	8.32E+03	743	1.69E+01		3	2.85E+00	49	1.39E+05	
5	2.63E+00	72	0.	1080	0.	8.326	5	1.91E+00	72	1.22E+04	
7	1.86E+00	95	0.	1433	0.		7	1.40E+00	95	9.70E+03	
9	1.33E+00	118	0.	1778	0.		9	1.07E+00	118	2.31E+04	
11	8.42E+07	141	1.17E+03	2123	0.	-33.0	11	7.49E+07	141	1.46E+04	
12	6.98E+07	164	9.21E+02	2468	0.		12	5.74E+07	164	4.79E+03	
14	7.72E+07	187	0.	2813	0.		14	5.92E+07	187	2.38E+03	
16	6.98E+07	210	0.	3158	0.	-31.7	16	4.48E+07	210	5.13E+03	
18	3.43E+07	233	0.	3503	0.		18	2.78E+07	233	1.87E+03	
19	2.30E+07	256	0.	3848	0.		19	2.05E+07	256	2.06E+03	
21	1.54E+07	279	0.	4193	0.		21	1.58E+07	279	0.	
23	1.43E+07	302	0.	4538	0.	120.7	23	1.35E+07	302	2.85E+02	
25	1.43E+07	325	0.	4883	0.		25	1.05E+07	325	5.69E+02	
27	9.82E+06	348	0.	5228	0.		27	7.02E+06	348	6.12E+02	
IWC MED D	2.07E-03 17		2.51E-05 89			TOTALS 279	IWC MED D	1.65E-03 18			TOTALS 320
						1.82E-04 293		7.75E-04 93			1.74E-02 324

AFML CIRRHUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS:18:44:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: SMALL SNOW

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	4.03E+00	26	3.28E+04	465	8.03E+02	376.4	2	1.82E+09	26	0.	465	0.	487.4
3	3.19E+00	49	1.74E+04	743	5.20E+02		3	1.94E+08	49	0.	743	0.	
5	1.93E+00	72	8.11E+03	1080	1.53E+02	ALT (KM)	5	1.14E+08	72	0.	1080	0.	7.053
7	1.39E+00	95	7.25E+03	1433	4.25E+01	7.609	7	8.19E+07	95	0.	1433	0.	
9	1.05E+00	118	6.58E+03	1778	8.75E+00	TEMP (C)	9	6.51E+07	118	0.	1778	0.	TEMP (C)
11	8.27E+07	141	2.43E+03	2123	2.47E+00	-28.2	11	4.12E+07	141	0.	2123	0.	-23.5
12	5.51E+07	164	9.63E+02	2468	0.	FROSTPOINT	12	2.28E+07	164	0.	2468	0.	FROSTPOINT
14	6.07E+07	187	5.17E+03	2813	0.	-29.3	14	2.24E+07	187	0.	2813	0.	-33.0
16	4.10E+07	210	1.71E+03	3158	0.		16	1.42E+07	210	0.	3158	0.	
18	2.40E+07	233	9.30E+02	3503	0.	TAS (M/S)	18	5.14E+06	233	0.	3503	0.	TAS (M/S)
19	1.41E+07	256	1.03E+03	3848	0.	115.7	19	1.02E+06	256	0.	3848	0.	111.3
21	1.29E+07	279	0.	4193	0.		21	2.42E+06	279	0.	4193	0.	
23	1.20E+07	302	4.99E+02	4538	0.	TOTALS	23	9.05E+05	302	0.	4538	0.	
25	9.37E+06	325	9.98E+02	4883	0.	6.73E-03	25	9.11E+05	325	0.	4883	0.	
27	5.26E+06	348	9.64E+02	5228	0.	332	27	9.07E+05	348	0.	5228	0.	
IMC	1.49E-03		3.97E-04		6.33E-03		IMC	4.51E-04		0.		0.	
MED D	17		123		339		MED D	13		0		0	

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AFML CIRRHUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL STARTS:18:45:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: SMALL SNOW

INTERVAL STARTS:18:44:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: SMALL SNOW

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	6.07E+00	26	0.	465	0.	392.2	2	3.44E+09	26	0.	465	0.	422.8
3	3.04E+00	49	0.	743	0.	ALT (KM)	3	1.13E+08	49	0.	743	0.	ALT (KM)
5	2.20E+00	72	0.	1080	0.	7.322	5	5.77E+07	72	0.	1080	0.	6.789
7	1.62E+00	95	0.	1433	0.	TEMP (C)	7	3.80E+07	95	0.	1433	0.	TEMP (C)
9	1.05E+00	118	0.	1778	0.	-25.7	9	2.31E+07	118	0.	1778	0.	-21.6
11	7.34E+07	141	0.	2123	0.	FROSTPOINT	11	1.40E+07	141	0.	2123	0.	FROSTPOINT
12	5.02E+07	164	0.	2468	0.	-32.7	12	5.92E+06	164	0.	2468	0.	-38.4
14	3.85E+07	187	0.	2813	0.		14	5.92E+06	187	0.	2813	0.	
16	2.81E+07	210	0.	3158	0.	TAS (M/S)	16	1.56E+06	210	0.	3158	0.	TAS (M/S)
18	1.20E+07	233	0.	3503	0.	113.4	18	6.22E+05	233	0.	3503	0.	108.6
19	5.67E+06	256	0.	3848	0.		19	6.26E+05	256	0.	3848	0.	
21	2.98E+06	279	0.	4193	0.	TOTALS	21	0.	279	0.	4193	0.	
23	2.38E+06	302	0.	4538	0.	0.	23	0.	302	0.	4538	0.	
25	2.09E+06	325	0.	4883	0.	0.	25	0.	325	0.	4883	0.	
27	1.20E+06	348	0.	5228	0.	0.	27	0.	348	0.	5228	0.	
IMC	8.34E-04		0.		0.		IMC	1.38E-04		0.		0.	
MED D	14		0		0		MED D	9		0		0	

AFWL CIRRUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL START: 184600*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M*3-MM)
TYPE: SMALL SNOW

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING
INTERVAL START: *18:47:00*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: SMALL SNOW .

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB) 439.5	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB) 473.9
2	3.69E+09	26	0.	465	0.		2	3.67E+09	26	0.	465	0.	
3	8.29E+07	49	0.	743	0.	ALT (KM)	3	5.85E+07	49	C.	743	0.	ALT (KM)
5	3.30E+07	72	0.	1080	0.	6.512	5	2.10E+07	72	0.	1080	0.	5.966
7	1.96E+07	95	C.	1433	0.		7	1.14E+07	95	2.68E+03	1433	0.	
9	6.09E+06	118	0.	1778	0.	TEMP (C)	9	8.78E+06	118	0.	1778	0.	TEMP (C)
11	1.97E+06	141	0.	2123	0.	-20.9	11	3.57E+06	141	0.	2123	0.	-17.8
12	1.98E+06	164	0.	2468	0.		12	2.27E+06	164	0.	2468	0.	
14	9.50E+05	187	0.	2813	0.	FROSTPOINT	14	9.73E+05	187	0.	2813	0.	FROSTPOINT
16	3.17E+05	210	0.	3158	0.	-23.7	16	6.50E+05	210	0.	3158	0.	-37.6
18	3.17E+05	233	C.	3503	0.		18	0.	233	0.	3503	0.	
19	0.	256	0.	3848	0.	TAS (M/S)	19	0.	256	0.	3848	0.	TAS (M/S)
21	0.	279	0.	4193	0.	106.5	21	0.	279	0.	4193	0.	106.2
23	0.	302	C.	4538	0.		23	0.	302	C.	4538	0.	
25	0.	325	0.	4883	0.		25	0.	325	0.	4883	0.	
27	0.	348	0.	5228	0.		27	0.	348	0.	5228	0.	
IMC D	7.26E-05					TOTALS	IMC D	6.41E-05					TOTALS
MED D			0		0.		MED D	3		8.30E-06		0.	8.38E-06
										6.3		0	6.3

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INTERVAL START: *18:46:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)
TYPE: SMALL SNOW

INTERVAL START: *18:47:30*
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M*3-MM)
TYPE: SMALL SNOW

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB) 490.9
2	3.60E+09	26	0.	465	0.	
3	5.96E+07	49	0.	743	0.	ALT (KM)
5	2.77E+07	72	0.	1068	0.	5.708
7	1.35E+07	95	0.	1433	0.	
9	8.38E+06	118	0.	1778	0.	TEMP (C)
11	5.48E+06	141	0.	2123	0.	-16.6
12	1.61E+06	164	0.	2468	0.	
14	1.29E+06	187	0.	2813	0.	FROSTPOINT
16	6.43E+05	210	0.	3158	0.	-38.9
18	9.70E+05	233	0.	3503	0.	
19	0.	256	0.	3848	0.	TAS (M/S)
21	0.	279	0.	4193	0.	102.2
23	0.	302	0.	4538	0.	
25	0.	325	0.	4883	0.	
27	0.	348	0.	5228	0.	
TOTALS						
IMC	7.26E-05	0.	0.	3.66E-05	0.	TOTALS
MED	5	0	0	2	0	0.

AFWL CIRRUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING

INTERVAL START: 18:48:00

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)

TYPE: SMALL SNOW

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	4.12E+09	26	0.	465	0.	509.2
3	2.07E+07	49	0.	743	0.	ALT (KM)
5	0.	72	0.	1088	0.	5.172
7	0.	95	0.	1433	0.	TEMP (C)
9	0.	118	0.	1778	0.	-11.6
11	0.	141	0.	2123	0.	FROSTPOINT
12	0.	164	0.	2468	0.	-36.8
14	0.	187	0.	2813	0.	TAS (M/S)
16	0.	210	0.	3158	0.	102.4
18	0.	233	0.	3503	0.	TOTALS
19	0.	256	0.	3848	0.	0.
21	0.	279	0.	4193	0.	0
23	0.	302	0.	4538	0.	
25	0.	325	0.	4883	0.	
27	0.	348	0.	5228	0.	
IMC	3.70E-05	0.	0.	0.	0.	
MED D	2	0.	0.	0.	0.	

AFWL CIRRUS STUDY BY AFGL

FLIGHT E78-09 ON 21 MAR 78 30 SECOND AVERAGING

INTERVAL START: 18:49:00

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)

TYPE: SMALL SNOW

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	4.03E+09	26	0.	465	0.	527.7
3	1.36E+07	49	0.	743	0.	ALT (KM)
5	0.	72	0.	1088	0.	5.172
7	0.	95	0.	1433	0.	TEMP (C)
9	0.	118	0.	1778	0.	-11.6
11	0.	141	0.	2123	0.	FROSTPOINT
12	0.	164	0.	2468	0.	-36.8
14	0.	187	0.	2813	0.	TAS (M/S)
16	0.	210	0.	3158	0.	102.4
18	0.	233	0.	3503	0.	TOTALS
19	0.	256	0.	3848	0.	0.
21	0.	279	0.	4193	0.	0
23	0.	302	0.	4538	0.	
25	0.	325	0.	4883	0.	
27	0.	348	0.	5228	0.	
IMC	3.59E-05	0.	0.	0.	0.	
MED D	2	0.	0.	0.	0.	

INTERVAL START: 18:48:30

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)

TYPE: SMALL SNOW

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	3.92E+09	26	0.	465	0.	521.7
3	1.22E+07	49	0.	743	0.	ALT (KM)
5	6.54E+05	72	0.	1088	0.	5.258
7	3.24E+05	95	0.	1433	0.	TEMP (C)
9	0.	118	0.	1778	0.	-12.7
11	0.	141	0.	2123	0.	FROSTPOINT
12	0.	164	0.	2468	0.	-35.2
14	0.	187	0.	2813	0.	TAS (M/S)
16	0.	210	0.	3158	0.	102.9
18	0.	233	0.	3503	0.	TOTALS
19	0.	256	0.	3848	0.	0.
21	0.	279	0.	4193	0.	0
23	0.	302	0.	4538	0.	
25	0.	325	0.	4883	0.	
27	0.	348	0.	5228	0.	
IMC	3.51E-05	0.	0.	0.	0.	
MED D	2	0.	0.	0.	0.	

INTERVAL START: 18:49:30

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)

TYPE: SMALL SNOW

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	3.96E+09	26	0.	465	0.	530.7
3	1.31E+07	49	0.	743	0.	ALT (KM)
5	0.	72	0.	1088	0.	5.131
7	0.	95	0.	1433	0.	TEMP (C)
9	0.	118	0.	1778	0.	-11.6
11	0.	141	0.	2123	0.	FROSTPOINT
12	0.	164	0.	2468	0.	-40.1
14	0.	187	0.	2813	0.	TAS (M/S)
16	0.	210	0.	3158	0.	98.0
18	0.	233	0.	3503	0.	TOTALS
19	0.	256	0.	3848	0.	0.
21	0.	279	0.	4193	0.	0
23	0.	302	0.	4538	0.	
25	0.	325	0.	4883	0.	
27	0.	348	0.	5228	0.	
IMC	3.53E-05	0.	0.	0.	0.	
MED D	2	0.	0.	0.	0.	

List of Abbreviations

1. AFGL - Air Force Geophysics Laboratory
2. AFWL - Air Force Weapons Laboratory
3. ALL - Airborne Laser Laboratory
4. ART - Advanced Radiation Technology
5. ASSP - Axial Scattering Spectrometer Probe
6. BKN - Broken
7. C - Degrees Celsius
8. C+P - IWC value obtained by combining data from the cloud and precipitation spectrometer probes
9. Ci - Cirrus
10. DIA - Mean volume diameter of melted particles (in μm)
11. IWC - Ice Water Content
12. MSL - Mean Sea Level
13. MU - Micrometers (used in computer listings)
14. N - Number of particles
15. OVC - Overcast
16. PMS - Particle Measuring Systems, Inc.
17. SCT - Scattered
18. TAS - True Air Speed
19. Z - Universal or Greenwich Mean Time
20. μm - Micrometers = 10^{-6} meters
21. 1-D - 1 Dimensional PMS probe
22. 2-D - 2 Dimensional PMS probe